

# UNCLASSIFIED

|  |
|--|
|  |
|  |
|  |
|  |
| AD NUMBER  |
| AD865520   |
| NEW LIMITATION CHANGE  |
| TO<br>Approved for public release, distribution unlimited  |
| FROM<br>Distribution authorized to U.S. Gov't. agencies and their contractors; Critical Technology; 16 FEB 1970. Other requests shall be referred to Army Research Office, Durham, NC 27706. |
| AUTHORITY  |
| USARO, per ODDREmemo. 12 Oct 1970  |

THIS PAGE IS UNCLASSIFIED

The Joint Institute for Laboratory Astrophysics was created in 1962 through the collaboration of the University of Colorado and the National Bureau of Standards, U. S. Dept. of Commerce, for the purpose of furthering research and graduate education in laboratory astrophysics—laboratory and theoretical investigations of physical processes of astrophysical importance. The major fields of activity are low energy atomic physics, theoretical astrophysics, and aerodynamics.

The institute is located on the campus of the University of Colorado. The academic staff are members of the Department of Physics and Astrophysics, of the College of Arts and Sciences, or the Department of Aerospace Engineering Sciences, of the College of Engineering. In addition to certain members of these faculties, the scientific staff of JILA includes Visiting Fellows and Members from other institutes, graduate students and postdoctoral appointees.

The JILA is operated as a partnership between CU and NBS by the Fellows of JILA, responsible through their Chairman to the Director, the NBS, and the President, the University of Colorado. NBS appointed staff members of JILA constitute the NBS Laboratory Astrophysics Division (274.00).

*W. H. G. G. G.*  
24

AD 865520

# JILA INFORMATION CENTER REPORT

No. 10

## BIBLIOGRAPHY OF LOW ENERGY ELECTRON COLLISION CROSS SECTION DATA (1967-1969)

by

G. E. Chamberlain

L. J. Kleffer

STATEMENT #2 UNCLASSIFIED

This document is public

*Army Research Office  
Durham, N. C. 27706  
Prof. C. M. Dupe. H. H.*

### IMPORTANT NOTICE

The JILA maintains an Information Center for collecting and critically evaluating atomic collision data which are of interest to plasma physicists and astrophysicists. This report from the JILA Information Center contains material which is of transitory interest or which is of interest to a limited audience. Information which warrants wider circulation will be published in appropriate journals. Although the material in this report has been subjected to critical technical review, reproduction, quotation, or citation of it in the open literature is not permitted without express permission of the author or the Chairman of the JILA. If this constitutes a technical report to a sponsoring agency, that agency may reproduce this material for further distribution within the government and to agency contractors.

Best Available Copy

University of Colorado  
Boulder, Colorado  
February 16, 1970

6  
10  
02  
03  
01  
03  
01  
01

This research was supported in part by the Advanced Research Projects Agency of the Department of Defense, monitored by Army Research Office-Durham, under Contract DA-31-124-ARO-D-139, and in part by the National Bureau of Standards through the National Standard Reference Data Program.

# CONTENTS

|  |           |
|--|-----------|
| I. INTRODUCTION-----                             | Page<br>v |
| II. ERRATA                                       |           |
| Errata to NBS Misc. Pub. 289-----                | ix        |
| Published Errata to Cross Section Citations----- | xi        |
| III. BIBLIOGRAPHY: ELECTRON PAPERS               |           |
| Elastic Scattering Experimental-----             | 3         |
| Elastic Scattering Theoretical-----              | 3         |
| Electronic Excitation Experimental-----          | 4         |
| Electronic Excitation Theoretical-----           | 4         |
| Electron Detachment Experimental-----            | 6         |
| Electron Detachment Theoretical-----             | 6         |
| De-Excitation Experimental-----                  | 6         |
| De-Excitation Theoretical-----                   | 6         |
| Ionization Experimental-----                     | 6         |
| Ionization Theoretical-----                      | 7         |
| Dissociation Experimental-----                   | 8         |
| Dissociation Theoretical-----                    | 8         |
| Free-Free Emission Theoretical-----              | 8         |
| Dissociative Ionization Experimental-----        | 8         |
| Dissociative Ionization Theoretical-----         | 8         |
| Radiative Capture Experimental-----              | 8         |
| Rotational Excitation Experimental-----          | 8         |
| Rotational Excitation Theoretical-----           | 8         |
| Vibrational Excitation Experimental-----         | 8         |
| Vibrational Excitation Theoretical-----          | 9         |
| Dissociative Attachment Experimental-----        | 9         |
| Dissociative Attachment Theoretical-----         | 9         |
| Total Scattering Experimental-----               | 9         |
| POSITRON PAPERS                                  |           |
| Elastic Scattering Theoretical-----              | 10        |
| Electronic Excitation Theoretical-----           | 10        |
| Ionization Theoretical-----                      | 10        |
| Rotational Excitation Theoretical-----           | 10        |
| IV. BIBLIOGRAPHIC REFERENCES-----                | 11        |
| V. AUTHOR INDEX-----                             | 37        |

## I. INTRODUCTION

This bibliography is a supplement to a previously issued bibliography\* and includes all of the bibliographic material on electron collisions that has been added to our files since the previous publication. The literature for JILA Information Center Report No. 10 was searched from October, 1966, through October, 1969. Additional references from 1969 may not be included because of the delay time involved in adding items to our files and because we rely upon the abstracting journals to obtain references from sources which do not in general contain information of interest. The current scientific literature is searched on a continuing basis and items omitted herein will be included in future updatings of this bibliography.

The Electron Collision Cross Section Bibliography is divided into three main sections. The first section codes the data which are in the references included in the bibliography. The second section lists the title, authors and complete reference for the paper cited. These are ordered by their "file" number. The third section consists of an alphabetical author index. After each name is a list of the "file" numbers of articles authored or co-authored to be found in the bibliographic section.

### Description of the Coding Format

The data are categorized by a hierarchy of descriptors in the following order:

1. Process (e.g., elastic scattering, electronic excitation, etc.)
2. Experimental or Theoretical
3. Normalized or Relative (The data are considered normalized if given in absolute units.)
4. Atomic or Molecular Species including the degree of ionization of the species.

(A negative ion is indicated by a minus sign; neutral unexcited species by a blank; neutral excited species by a star; and a positive ion by a number indicating the degree of positive ionization. All of these symbols follow the atomic species, which are listed in ascending order of nuclear charge, Z. Molecular species are listed in arbitrary order.)

---

\*"Bibliography of Low Energy Electron Collision Cross Section Data," by L. J. Kieffer, NBS Miscellaneous Publication #289, 1967, available from the U.S. Government Printing Office, price 50 cents.

649 862

5. The references in which the data described are found. The references are identified by a file number, the first author, and the year of publication (e.g., 63 implies 1963).

The following comments about categories (see Contents) will aid in the proper use of the bibliography. The category Elastic Scattering replaces the previous categories Total Elastic and Differential Elastic Scattering. The following categories were deleted: Radiative Attachment, Dissociative Recombination, and Radiative Recombination. The category Total Scattering covers cross sections which are the sum of elastic and inelastic cross sections. It includes any references to experimentally determined cross sections in which the experiment does not distinguish between elastically and inelastically scattered electrons even if the experiment is carried out in an energy range in which only elastic scattering is expected.

The abbreviations for journal titles are taken from Chemical Abstracts or if not abstracted there, from Science Abstracts, Series A Physics Abstracts.

#### Electron Collision Cross Section Bibliography

The criterion used in choosing the references for this bibliography is that the publication contain original measurements or calculations of electron cross sections. The target species covered were all the atoms plus simple molecules of atmospheric and astrophysical interest. The incident energy range covered was 0 to 10 KeV. The upper limit on the energy was not used as an absolute limit; however, one should not expect to find electron collision cross sections in the range of 50 KeV and above.

Papers containing the following quantities, which are not explicitly cross sections, have also been collected:

1. phase shifts,
2. scattering lengths,
3. ionization efficiencies,
4. excitation efficiencies.

The reason for including these quantities is that under the proper conditions, cross sections have been or can be simply derived from them.

Published manuscripts, theses, reports given at meetings, and company or agency reports which have been printed and circulated are included in the bibliography. However, reference is not made to material that is unavailable either through library facilities or government document centers. (No classified material is included.)

---

<sup>†</sup>These processes are covered in part in JILA Information Center Report No. 4, A Bibliography of Electron Swarm Data 1967, by J. Dutton.

There is a tendency for authors to publish material which is identical to that which they have reported on at a meeting (which is printed and circulated) and also issued as a company or agency report. In some cases it is possible to verify that this is so and in those cases only one reference (the formal publication if there is one) is kept in our bibliography. In most cases it is not possible to make such a precise distinction among such documents, since only some of the material may have been available before. Because of this, there may be more than one reference to the same original data. We have tried to keep this to a minimum consistent with our aim of collecting all published data.

Inclusion of a reference in this bibliography does not imply a value judgment about the accuracy of the information. We only assert that this reference claims to report a measured or calculated electron collision cross section (or the equivalent as described previously). The question of the accuracy of the data is to be covered in separate published critical reviews [see, for example, Kieffer, L. J. and G. H. Dunn, Rev. Mod. Phys. 38, 1, (1966); Moiseiwitsch, B. L. and S. J. Smith, Rev. Mod. Phys. 40, 238 (1968)].

The authors would like to gratefully acknowledge the assistance of the staff of the JILA Information Center. The computer programs used for this report were written by Patricia Ruttenberg. The manuscript was prepared by Elizabeth Hosack and Victoria Tempey.

# ERRATA TO NBS MISC. PUB. 289\*

The following should be deleted from the bibliography of electron processes:

|            |                          |              |
|------------|--------------------------|--------------|
|            | Total Elastic Scattering | Experimental |
| Normalized |                          |              |
| H          | 0933 Cody, 64            |              |

|          |                                 |              |
|----------|---------------------------------|--------------|
|          | Differential Elastic Scattering | Experimental |
| Relative |                                 |              |
| Hg       | 0486 Kessler, 65                |              |

|            |                       |             |
|------------|-----------------------|-------------|
|            | Electronic Excitation | Theoretical |
| Normalized |                       |             |
| H          | 0585 Seaton, 62       |             |

|          |               |              |
|----------|---------------|--------------|
|          | Dissociation  | Experimental |
| Relative |               |              |
| H2O      | 0924 Mann, 40 |              |
| N H3     | 0924 Mann, 40 |              |

|            |               |  |
|------------|---------------|--|
| Normalized |               |  |
| O2         | 1460 Rapp, 65 |  |
| N O        | 1460 Rapp, 65 |  |
| N2         | 1460 Rapp, 65 |  |
| N2O        | 1460 Rapp, 65 |  |
| C O2       | 1460 Rapp, 65 |  |
| C O        | 1460 Rapp, 65 |  |

The following should be added to the bibliography of electron processes:

|            |                                 |              |
|------------|---------------------------------|--------------|
|            | Differential Elastic Scattering | Experimental |
| Normalized |                                 |              |
| Hg         | 0486 Kessler, 65                |              |

The following should be added to the bibliography of positron processes:

|            |                          |             |
|------------|--------------------------|-------------|
|            | Total Elastic Scattering | Theoretical |
| Normalized |                          |             |
| H          | 0933 Cody, 64            |             |

The following should be deleted from the citation and author lists:

585 Seaton, M. J. (The paper is correctly listed as 534.)

---

\* National Bureau of Standards Miscellaneous Publication 289, 1967, U. S. Government Printing Office, price 50 cents.

PUBLISHED ERRATA TO ELECTRON COLLISION CROSS SECTION CITATIONS

| <u>File</u> | <u>Citation</u>  | <u>Erratum</u>                               |
|-------------|--|--|
| 20          | Hughes, A. L. and McMillen, J. H., Inelastic and elastic electron scattering in argon, Phys Rev <u>39</u> , 585-600 (1932).  | Phys Rev <u>40</u> , 469-70 (1932).          |
| 256         | DeVore, R. V., Absorption and Bremsstrahlung cross sections of nitrogen for slow electrons, Phys Rev <u>136</u> , A666-8 (1964).                                       | Phys Rev <u>140</u> , AB3 (1965).            |
| 332         | Stebbing, R. F. et al., Collisions of electrons with hydrogen atoms. V. Excitation of metastable 2S hydrogen atoms, Phys Rev <u>119</u> , 1939-45 (1960).              | Phys Rev <u>124</u> , 2051-2 (1961).         |
| 503         | Temkin, A., Electron-hydrogen phase shifts just below the inelastic threshold, Phys Rev Lett <u>10</u> , 22-5 (1963).  | Phys Rev Lett <u>11</u> , 278-81 (1963).     |
| 773         | Feldman, P. and Novick, R., Autoionizing states in the alkali atoms with microsecond lifetimes, Phys Rev Lett <u>11</u> , 278-81 (1963).                               | Phys Rev <u>168</u> , 270 (1968).            |
| 920         | Doering, J. P. and Mahan, B. H., Photoionization of nitric oxide, J Chem Phys <u>36</u> , 669-74 (1962).   | J Chem Phys <u>41</u> , 2724 (1963).         |
| 942         | St. John, R. M. and Lin, C. C., Production of excitation and ionization in helium by single-electron impact, J Chem Phys <u>41</u> , 195-7 (1964).                     | J Chem Phys <u>47</u> , 347 (1967).          |
| 1082        | Mjolsness, R. C. and Sampson, D. H., Distorted-wave calculation of rotational excitation of N <sub>2</sub> by slow electrons, Phys Rev Lett <u>13</u> , 812-15 (1964). | Phys Rev Lett <u>14</u> , 39 (1965).         |
| 1512        | McGowan, J. W., et al., Electron-H-atom elastic-scattering resonances, Phys Rev Lett <u>15</u> , 917-20 (1965).  | Phys Rev Lett <u>17</u> , 66 (1966).         |
| 1673        | Mittleman, M. H., Single and double ionization of He by electrons, Phys Rev Lett <u>16</u> , 498-9 (1966).   | Phys Rev Lett <u>16</u> , 779 (1966).        |
| 1695        | Fox, M. A., Electron excitation from the ground state of helium to the 3 <sup>1</sup> D state, Proc Phys Soc London <u>88</u> , 65-9 (1966).                           | Proc Phys Soc London <u>90</u> , 585 (1967). |
| 2626        | Anderson, R. J. et al., Electron excitation functions of mercury, Phys Rev <u>157</u> , 31 (1967).   | Phys Rev <u>185</u> , 404 (1969).            |

| <u>File</u> | <u>Citation</u>   | <u>Erratum</u>                        |
|-------------|---|---------------------------------------|
| 2647        | Kieffer, L. J. and Dunn, G. H., Dissociative ionization of H <sub>2</sub> and D <sub>2</sub> , Phys Rev <u>158</u> , 61-5 (1967).                           | Phys Rev <u>164</u> , 270 (1967).     |
| 2696        | Lassettre, E. N. et al., Electron-impact spectrum of ethane, J Chem Phys <u>46</u> , 4536-7 (1967).   | J Chem Phys <u>48</u> , 539 (1968).   |
| 2759        | Feldman, P. and Novick, R., Auto-ionizing states on the alkali atoms with microsecond lifetimes, Phys Rev <u>160</u> , 143-58 (1967).                       | Phys Rev <u>168</u> , 270 (1968).     |
| 3729        | Moustafa Moussa, H. R. et al., Excitation of helium by 0.05-6 KeV electrons and polarization of the resulting radiation, Physica <u>40</u> , 517-49 (1969). | Physica <u>42</u> , 490 (1969).       |
| 3774        | Tai, H. et al., Angular distributions of elastically scattered electrons from hydrogen, Phys Rev Lett <u>22</u> , 1415 (1969).                              | Phys Rev Lett <u>23</u> , 453 (1969). |

### III. BIBLIOGRAPHY

| ELASTIC SCATTERING |  | EXPERIMENTAL  | ELASTIC SCATTERING |   | THEORETICAL  |
|--------------------|--|---|--------------------|---|--|
| NORMALIZED         |  |   | NORMALIZED         |   |  |
| HE                 | 1209 VRIENS,68<br>1817 BROMBERG,69   | 3565 SCHEARER,68  | C                  | 2060 ROBINSON,67<br>3268 HENRY,68<br>3704 SMITH,69                                  | 2616 SMITH,67<br>3700 HENRY,69   |
| NA                 | 1944 BALLING,66  |   | N                  | 2211 MJOLSNES,67<br>2714 MALINOWSKA-ADAMSKA,6<br>3700 HENRY,69                      | 2616 SMITH,67<br>3268 HENRY,68<br>3704 SMITH,69  |
| K                  | 2022 RUMIN,59  |   | O -                | 1744 PEIXOTO,69   |  |
| CS                 | 3202 NIGHAN,67   |   | O                  | 0588 HENRY,67<br>2016 BREIG,66<br>2071 GARRETT,67<br>2616 SMITH,67<br>3700 HENRY,69 | 0878 GINGO,66<br>2060 ROBINSON,67<br>2211 MJOLSNES,67<br>2714 MALINOWSKA-ADAMSKA,67<br>3704 SMITH,69 |
| HG                 | 3011 EITEL,68  |   | F                  | 2060 ROBINSON,67  |  |
| N2                 | 1817 BROMBERG,69   |   | F 1                | 3825 MANSON,69  |  |
| C O                | 3817 BROMBERG,69   |   | NE                 | 1139 THOMPSON,66  | 3844 SHEORFY,69  |
| RELATIVE           |  |   | NE *               | 1926 ROBINSON,69  |  |
| H                  | 3774 TAI,69  |   | NE 1               | 3744 PEIXOTO,69   | 3825 MANSON,69   |
| HE                 | 2290 MEHR,67<br>3513 SCHACKERT,68  | 2912 CHAMBERLAIN,67<br>3450 CIBSON,69   | NA                 | 2093 GARRETT,65   |  |
| NE                 | 2290 MEHR,67   | 3513 SCHACKERT,68   | NA 1               | 3744 PEIXOTO,69   | 3825 MANSON,69   |
| AR                 | 2290 MEHR,67   | 3513 SCHACKERT,68   | SI                 | 2060 ROBINSON,67  |  |
| K                  | 2947 COLLINS,67  |   | SI 1               | 3825 MANSON,69  |  |
| KR                 | 2290 MEHR,67   | 3513 SCHACKERT,68   | S                  | 2060 ROBINSON,67  |  |
| XE                 | 2290 MEHR,67   | 3513 SCHACKERT,68   | CL                 | 2060 ROBINSON,67  |  |
| HG                 | 2023 YEATES,67   |   | AR                 | 1139 THOMPSON,66<br>3882 MEISTER,68   | 3248 YATES,68<br>3844 SHEORFY,69   |
| BI                 | 1570 HAUG,68   |   | AR *               | 3426 ROBINSON,69  |  |
| H2                 | 3252 EHRHARDT,68   | 3377 EHRHARDT,68  | AR 1               | 3825 MANSON,69  |  |
| N2                 | 2179 EHRHARDT,67   |   | K 1                | 3825 MANSON,69  |  |
| C O                | 3377 EHRHARDT,68   |   | CA 1               | 3825 MANSON,69  |  |
| ELASTIC SCATTERING |  | THEORETICAL   | SC 1               | 3825 MANSON,69  |  |
| NORMALIZED         |  |   | NI 1               | 3825 MANSON,69  |  |
| H -                | 3522 MCDOWELL,68   |   | 2M 1               | 3825 MANSON,69  |  |
| H                  | 1169 KRAIDY,66<br>1976 ORMONDE,63<br>2126 JHA,66<br>2159 MOLT,68<br>2754 MICHELS,67<br>2959 CALLAWAY,68<br>3058 RARIK,67<br>3258 ARMSTEAD,68<br>3371 MADAN,68<br>3404 KELLY,68<br>3701 GARRETT,69<br>3738 MOHR,69<br>3774 TAI,69<br>3822 FRANCO,68 | 1904 GUPTA,67<br>2059 HOUSTON,68<br>2129 JHA,66<br>2749 JHA,67<br>2758 KELLY,67<br>2968 BANERJEE,67<br>3215 SLOAN,68<br>3370 MALL,68<br>3394 JHA,67<br>3511 SCHLESSINGER,68<br>3728 TRUHLAR,68<br>3742 ORMONDE,69<br>3881 McDONALD,69 | GA 1               | 3825 MANSON,69  |  |
| HE                 | 1102 BANERJEE,66<br>2059 HOUSTON,68<br>2075 LAMSON,66<br>2127 BANERJEE,66<br>2751 BANERJEE,67<br>3340 HERZENBERG,68<br>3452 JHA,67<br>3586 HOUSTON,68<br>3686 MICHELS,69<br>3749 KWARE,69<br>3844 SHEOREY,69                                       | 2005 PU,66<br>2070 MASHIMO,66<br>2114 GUPTA,66<br>2714 MALINOWSKA-ADAMSKA,67<br>2959 CALLAWAY,68<br>3341 KENNEDY,68<br>3567 DOUGHTY,68<br>3683 PETROKOP,68<br>3705 POY,68<br>3772 LABAMN,69   | GE 1               | 3825 MANSON,69  |  |
| HE *               | 1364 MUSAIN,67<br>3826 ROBINSON,69   | 3516 SKLAREW,68   | NR                 | 2060 ROBINSON,67  | 3248 YATES,68  |
| HE 1               | 3825 MANSON,69   |   | KR                 | 3248 YATES,68   |  |
| LI                 | 2093 GARRETT,65<br>3348 FEAUTRIER,68   | 3857 HARRIOTT,67<br>3838 BURKE,69   | KR *               | 3826 ROBINSON,69  | 3882 MEISTER,68  |
| LI 1               | 3522 MCDOWELL,68   | 3825 MANSON,69  | RB                 | 3771 BALLING,69   |  |
| HE 1               | 3348 FEAUTRIER,68  |   | Y 1                | 3825 MANSON,69  |  |
| BE 3               | 3844 SHEOREY,69  |   | QH 1               | 3825 MANSON,69  |  |
| BE 4               | 3844 SHEOREY,69  |   | I                  | 2060 ROBINSON,67  |  |
| B                  | 2177 SMOODGRASS,66   |   | XE                 | 3342 KARIVANOV,68   |  |
|                    |  |   | XE *               | 3826 ROBINSON,69  |  |
|                    |  |   | XE 1               | 3825 MANSON,69  |  |
|                    |  |   | CS                 | 1178 BASU,66  |  |
|                    |  |   | FU 1               | 3825 MANSON,69  |  |
|                    |  |   | TA 1               | 3825 MANSON,69  |  |
|                    |  |   | AU 1               | 3825 MANSON,69  |  |
|                    |  |   | HG                 | 3731 WALKER,69<br>3882 MEISTER,68   | 3773 YATES,69  |
|                    |  |   | HG 1               | 3825 MANSON,69  |  |
|                    |  |   | H2                 | 0893 SHEPPARD,66<br>2464 HARA,67<br>3843 HENRY,69                                   | 1993 LANE,67<br>2777 WILKINS,67  |
|                    |  |   | H2 1               | 2027 TENKIN,67  | 3411 WEINBERG,68   |

PRECEDING PAGE BLANK

| ELASTIC SCATTERING    |                         | THEORETICAL          |  | ELECTRONIC EXCITATION |                      | EXPERIMENTAL         |  |
|-----------------------|-------------------------|----------------------|--|-----------------------|----------------------|----------------------|--|
| NORMALIZED            |                         |                      |  | NORMALIZED            |                      |                      |  |
| N2                    | 8893 SHEPPARD,66        |                      |  | C O4                  | 3432 VROOM,69        |                      |  |
| H20                   | 2857 SHIMIZU,63         |                      |  | RELATIVE              |                      |                      |  |
| N H3                  | 2857 SHIMIZU,63         |                      |  | HE                    | 1148 SIMPSON,66      | 2872 SOLTYSIK,67     |  |
| CL2                   | 8893 SHEPPARD,66        |                      |  |                       | 2474 ZAPESOCCHNYI,66 | 2175 DUGAN,67        |  |
| N CL                  | 3787 IYIKAWA,69         |                      |  |                       | 2176 DOWELL,66       | 2941 MCFARLAND,67    |  |
| C N                   | 3787 IYIKAWA,69         |                      |  |                       | 2642 MEDOLE,67       | 2648 MEDOLF,67       |  |
|                       |                         |                      |  |                       | 2658 EHRHARDT,67     | 2911 GAVALLAS,67     |  |
|                       |                         |                      |  |                       | 2912 CHAMBERLAIN,67  | 2915 ODERING,67      |  |
|                       |                         |                      |  |                       | 2962 PICMANICK,68    | 3391 ANDRICK,68      |  |
|                       |                         |                      |  |                       | 3418 EHRHARDT,68     | 3748 WHITTAKER,67    |  |
|                       |                         |                      |  |                       | 3487 IONIKH,69       | 3813 KUPPERMANN,68   |  |
| ELECTRONIC EXCITATION |                         | EXPERIMENTAL         |  | HE                    | 1 2422 DALY,67       | 3323 REDHEAD,68      |  |
| NORMALIZED            |                         |                      |  | LI                    | 1998 ALEKSAMIN,66    |                      |  |
| M                     | 2821 MILS,66            | 2962 KLEINPOPPEN,68  |  | N                     | 2874 ZAPESOCCHNYI,66 |                      |  |
|                       | 3827 LONG,68            | 3373 WILLIAMS,68     |  | NE                    | 2176 DOWELL,66       | 2911 GAVALLAS,67     |  |
|                       | 3836 MCCOWAN,69         |                      |  |                       | 2962 PICMANICK,68    |                      |  |
| ME                    | 2698 HEAVER,67          | 2757 SHPENIK,67      |  | NG                    | 2967 ZAPESOCCHNYI,66 |                      |  |
|                       | 2838 JOSE,67            | 2841 VRIENS,68       |  | AR                    | 2176 DOWELL,66       | 2911 GAVALLAS,67     |  |
|                       | 2983 JOSE,67            | 2916 LUCAS,63        |  |                       | 2962 PICMANICK,68    |                      |  |
|                       | 2929 HOUSTAFI MOUSSA,67 | 2983 JOSE,68         |  | K                     | 2874 ZAPESOCCHNYI,66 | 2757 SHPENIK,67      |  |
|                       | 3598 ZAPESOCCHNYI,67    | 3687 BARTS,68        |  |                       | 3849 RUBIN,69        |                      |  |
|                       | 3729 HOUSTAFI MOUSSA,69 | 3814 LASSETTRE,69    |  | CA                    | 3512 KARSTENSEN,68   |                      |  |
|                       | 3838 BRONGERSMA,68      | 3846 ANDERSON,69     |  | ZN                    | 2874 ZAPESOCCHNYI,66 | 2757 SHPENIK,67      |  |
| LI                    | 2726 ALEKSAMIN,67       | 2759 FELDMAN,67      |  |                       | 2967 ZAPESOCCHNYI,66 |                      |  |
|                       | 3863 ALEKSAMIN,67       |                      |  | NR                    | 2176 DOWELL,66       | 2962 PICMANICK,68    |  |
| ME                    | 2725 FELTSAN,66         | 2989 ZAPESOCCHNYI,67 |  | RR                    | 2366 SHIRON,64       |                      |  |
|                       | 3322 GUN,57             |                      |  | CD                    | 2874 ZAPESOCCHNYI,66 | 2987 ZAPESOCCHNYI,66 |  |
| ME                    | 3457 KHAIRIN,68         |                      |  |                       | 3419 ZAPESOCCHNYI,68 |                      |  |
| NA                    | 2838 ZAPESOCCHNYI,67    | 2971 FRISH,67        |  | XE                    | 2176 DOWELL,66       | 2962 PICMANICK,68    |  |
| AR                    | 2833 FELTSAN,67         | 3767 HERCFR,67       |  | CS                    | 3516 MERTEL,68       |                      |  |
| K                     | 2869 ZAPESOCCHNYI,66    | 2715 KORCHEVOI,67    |  | MG                    | 1988 BOGDANOVA,66    | 2874 ZAPESOCCHNYI,66 |  |
|                       | 2759 FELDMAN,67         | 2838 ZAPESOCCHNYI,67 |  |                       | 2628 BOGDANOVA,67    | 2823 YEATES,67       |  |
|                       | 3519 MERTEL,68          | 3776 MERTEL,69       |  |                       | 3418 ZAPESOCCHNYI,65 | 3528 ZAPESOCCHNYI,64 |  |
|                       | 3776 MERTEL,69          |                      |  |                       | 1889 SKERBELE,69     |                      |  |
| KR                    | 2799 FELTSAN,67         |                      |  | H2                    | 1889 CAYILL,67       | 2939 DOWELL,67       |  |
| RO                    | 1969 ZAPESOCCHNYI,66    | 2869 ZAPESOCCHNYI,66 |  |                       | 3445 TRAJNAR,68      |                      |  |
|                       | 2715 KORCHEVOI,67       | 2759 FELDMAN,67      |  | O2                    | 2176 KOVAL,66        | 3743 MASTER,69       |  |
|                       | 2838 ZAPESOCCHNYI,67    | 3776 MERTEL,69       |  |                       | 3445 TRAJNAR,68      |                      |  |
|                       | 3777 MERTEL,69          |                      |  | H2                    | 2176 KOVAL,66        | 2179 EHRHARDT,67     |  |
| CO                    | 2967 PENKIN,67          |                      |  |                       | 2659 SKERBELE,67     | 2827 LASSETTRE,62    |  |
| XE                    | 3888 FELTSAN,68         |                      |  |                       | 2915 ODERING,67      | 3762 BURNS,69        |  |
| CS                    | 2869 ZAPESOCCHNYI,66    | 2715 KORCHEVOI,67    |  |                       | 3813 KUPPERMANN,64   | 3824 RIDGE,69        |  |
|                       | 2838 ZAPESOCCHNYI,67    | 3777 MERTEL,69       |  | H20                   | 3823 MILLER,69       |                      |  |
| SA                    | 1 2938 BACON,64         |                      |  | N O                   | 3743 MASTER,69       |                      |  |
| MG                    | 8877 ANDERSON,66        | 2674 ANDERSON,67     |  | CM2                   | 2172 ODERING,67      | 2915 ODERING,67      |  |
|                       | 2643 FRISH,67           | 2757 SHPENIK,67      |  |                       | 3813 KUPPERMANN,68   |                      |  |
|                       | 2923 FOWLER,67          | 3848 BOST,69         |  | C O                   | 2684 SKERBELE,67     | 3289 FREUND,67       |  |
| H2                    | 3813 KUPPERMANN,68      | 3871 VROOM,69        |  |                       | 3743 MASTER,69       | 3813 KUPPERMANN,68   |  |
| O2                    | 3768 MCCOMNEY,69        |                      |  |                       | 3434 BEMPT,69        |                      |  |
| H2                    | 1989 ZAPESOCCHNYI,66    | 2128 JOSE,67         |  | C H4                  | 2518 EHRHARDT,67     | 3818 BRONGERSMA,69   |  |
|                       | 2978 MOLLAND,64         | 3864 SKUDENICH,67    |  |                       | 2874 ZAPESOCCHNYI,66 |                      |  |
|                       | 3687 BARTS,68           | 3718 STANTON,69      |  | O2                    | 2874 ZAPESOCCHNYI,66 |                      |  |
|                       | 3743 MASTER,69          | 3769 SHIVASTAVA,69   |  | CM4                   | 2686 LASSETTRE,67    | 3818 BRONGERSMA,69   |  |
|                       | 3838 BRONGERSMA,68      | 3833 SOKOL,69        |  | ELECTRONIC EXCITATION |                      | THEORETICAL          |  |
|                       | 3851 MCCOMNEY,69        |                      |  | NORMALIZED            |                      |                      |  |
| H2                    | 1 3338 LEE,68           |                      |  | N                     | 1113 COLTMAN,66      | 1171 CROTHERS,69     |  |
| H20                   | 3812 VROOM,69           |                      |  |                       | 1999 BURKE,66        | 2813 STAMPER,66      |  |
| C O2                  | 3838 BRONGERSMA,68      |                      |  |                       | 2822 MORRISON,66     | 2867 SMIDVAN,64      |  |
| C O                   | 3864 SKUDENICH,67       | 3374 SKUDENICH,67    |  |                       | 2877 ONTOVAR,67      | 2124 JMA,66          |  |
|                       | 3838 BRONGERSMA,68      |                      |  |                       | 2159 MOLT,68         | 2737 BEISHAN,67      |  |
| C H4                  | 3832 VROOM,69           |                      |  |                       | 2734 CROTHERS,67     | 2749 JMA,67          |  |
| O2                    | 3871 VROOM,69           |                      |  |                       | 2791 BURKE,67        | 2762 TAYLOR,67       |  |
| CM4                   | 3838 BRONGERSMA,68      | 3832 VROOM,69        |  |                       | 3884 MCDONELL,67     | 3888 BURKE,67        |  |
| CM6                   | 3832 VROOM,69           |                      |  |                       | 3888 RADIK,67        | 3865 VAINSHTEIN,67   |  |

| ELECTRONIC EXCITATION |  | THEORETICAL   | ELECTRONIC EXCITATION |                                | THEORETICAL       |
|-----------------------|--|---|-----------------------|--------------------------------|-------------------|
| NORMALIZED            |  |   | NORMALIZED            |                                |                   |
| H                     | 3388 HARRIOTT,68<br>3580 GAUDIN,68<br>3728 TRUHLAR,68<br>3775 KYLE,68<br>3839 KYLE,69  | 3572 PERESSE,65<br>3642 KOLODZIEJSKI,68<br>3742 ORMONDE,69<br>3805 OCHKUR,68  | MG                    | 6 2020 SARAPH,66               |                   |
| H *                   | 1946 PLUTA,66<br>2786 MOMMIN,67  | 2863 PURCELL,52<br>3216 VAN DERKON,68   | AL                    | 5 3294 CZYZAK,67               |                   |
| HE                    | 1941 JOACHAIN,66<br>2655 INOKUTI,67<br>2733 REIGHAN,67<br>2837 INOKUTI,67<br>3010 BELL,68<br>3059 LYASH,67<br>3200 RFL,68<br>3255 KANG,68<br>3344 CATHRIGHT,68<br>3579 LYASH,67<br>3698 VAINSTEIN,69<br>3733 BELL,69 | 2817 VRIENS,67<br>2605 MORRISON,67<br>2750 RAMERJEF,67<br>3802 KENNEDY,68<br>3819 BELL,68<br>3206 MILLER,68<br>3211 LIN,68<br>3341 KENNEDY,68<br>3521 KIM,68<br>3587 BELL,68<br>3770 VAN DEN BOS,69 | P                     | 1 1992 DELY,67                 | 3294 CZYZAK,67    |
| HE *                  | 2813 STAUFFER,66<br>3847 KIM,69  | 3856 HURKE,67   | S                     | 1 2335 CZYZAK,67               |                   |
| HE 1                  | 2427 ORMONDE,67<br>3734 HURKE,69   | 3861 KYLE,57  | S                     | 2 1992 DELY,67                 | 3294 CZYZAK,67    |
| LI                    | 3857 HARRIOTT,67<br>3838 BURKE,69  | 3789 MATHUR,69  | S 10                  | 2020 SARAPH,66                 |                   |
| LI 1                  | 2733 REIGHAN,67  | 3579 LYASH,67   | CL                    | 1 3294 CZYZAK,67               |                   |
| DE                    | 1 2118 DELY,66   |   | CL                    | 2 2335 CZYZAK,67               |                   |
| DE 2                  | 1579 LYASH,67  |   | CL                    | 3 1992 DELY,67                 | 3294 CZYZAK,67    |
| DE 3                  | 1579 LYASH,67  |   | AR                    | 1970 VELORE,65                 |                   |
| C                     | 2616 SMITH,67<br>3784 SMITH,69   | 3788 HENRY,69   | AR                    | 2 3294 CZYZAK,67               |                   |
| C 2                   | 2733 REIGHAN,67  |   | AR                    | 3 2335 CZYZAK,67               |                   |
| C 4                   | 2733 REIGHAN,67  | 3579 LYASH,67   | AR                    | 4 1992 DELY,67                 | 3294 CZYZAK,67    |
| H                     | 1970 VELORE,65<br>3788 HENRY,69  | 2616 SMITH,67<br>3784 SMITH,69  | AR 10                 | 3294 CZYZAK,67                 |                   |
| H 1                   | 1992 DELY,67<br>3788 HENRY,69  | 2870 SARAPH,66  | AR 11                 | 3294 CZYZAK,67                 |                   |
| H 4                   | 2118 DELY,66   |   | AR 12                 | 1992 DELY,67                   |                   |
| H 5                   | 3579 LYASH,67  |   | K                     | 3789 MATHUR,69                 |                   |
| O                     | 1970 VELORE,65<br>2616 SMITH,67<br>3788 HENRY,69   | 2813 STAUFFER,66<br>2824 REIG,66<br>3784 SMITH,69   | K                     | 3 3294 CZYZAK,67               |                   |
| O 1                   | 3294 CZYZAK,67<br>3739 MARTINS,69  | 3788 HENRY,69   | K                     | 4 2335 CZYZAK,67               |                   |
| O 2                   | 1992 DELY,67<br>3788 HENRY,69  | 3869 MIYAMOTO,41<br>3732 EISSNER,69   | K                     | 5 3294 CZYZAK,67               |                   |
| O 4                   | 3868 REIGHAN,67  |   | K 13                  | 1992 DELY,67                   |                   |
| O 6                   | 3579 LYASH,67  |   | CA                    | 3868 REIGHAN,67                |                   |
| F                     | 1 3294 CZYZAK,67   |   | CA                    | 1 1138 DELY,66                 | 3818 BURKE,68     |
| F 2                   | 3294 CZYZAK,67   | 3739 MARTINS,69   | CA                    | 4 3294 CZYZAK,67               |                   |
| ME                    | 1970 VELORE,65   |   | CA                    | 5 2335 CZYZAK,67               |                   |
| ME 2                  | 3294 CZYZAK,67   |   | CA                    | 6 1992 DELY,67                 | 3294 CZYZAK,67    |
| ME 3                  | 3294 CZYZAK,67   | 3739 MARTINS,69   | CA 14                 | 1992 DELY,67                   |                   |
| ME 4                  | 2020 SARAPH,66   |   | V                     | 7 3294 CZYZAK,67               |                   |
| ME 7                  | 2118 DELY,66   |   | V                     | 8 2335 CZYZAK,67               |                   |
| MA                    | 1159 POKHLYAKOV,66<br>3864 VAINSTEIN,67  | 2864 POKHLYAKOV,66<br>3788 MATHUR,69  | V                     | 9 1992 DELY,67                 | 3294 CZYZAK,67    |
| MA 3                  | 3294 CZYZAK,67   |   | CR                    | 8 3294 CZYZAK,67               |                   |
| MA 4                  | 3294 CZYZAK,67   | 3739 MARTINS,69   | CR 10                 | 1992 DELY,67                   | 3294 CZYZAK,67    |
| MA 5                  | 1992 DELY,67   |   | MM                    | 9 3294 CZYZAK,67               |                   |
| MA 1                  | 3818 BURKE,68  |   | MM 11                 | 1992 DELY,67                   | 3294 CZYZAK,67    |
| MA 4                  | 3294 CZYZAK,67   |   | FE                    | 10 3294 CZYZAK,67              |                   |
| MA 5                  | 3294 CZYZAK,67   |   | FE 11                 | 2335 CZYZAK,67                 |                   |
|                       |  |   | FE 12                 | 1992 DELY,67<br>3294 CZYZAK,67 | 2115 DELY,66      |
|                       |  |   | FE 13                 | 2832 POKHLYAKOV,42             |                   |
|                       |  |   | FE 14                 | 3813 DELY,67                   |                   |
|                       |  |   | NI                    | 12 3294 CZYZAK,67              |                   |
|                       |  |   | NI 14                 | 1992 DELY,67                   | 3294 CZYZAK,67    |
|                       |  |   | ZN                    | 3837 TOSPATNI,69               |                   |
|                       |  |   | ZN 24                 | 2020 SARAPH,66                 |                   |
|                       |  |   | ED                    | 1970 VELORE,65                 |                   |
|                       |  |   | OD                    | 3788 MATHUR,69                 |                   |
|                       |  |   | CO                    | 3837 TOSPATNI,69               |                   |
|                       |  |   | SE                    | 1970 VELORE,65                 |                   |
|                       |  |   | CS                    | 3788 MATHUR,69                 |                   |
|                       |  |   | ME                    | 2760 LIN,64                    | 3818 MCCOMMELL,68 |

| ELECTRONIC EXCITATION |  | THEORETICAL  |  | IONIZATION |   | EXPERIMENTAL   |  |
|-----------------------|--|--|--|------------|---|--|--|
| NORMALIZED            |  |  |  | NORMALIZED |   |  |  |
| HG                    | 3616 YAVORSKY,52   | 3837 TRIPATHI,69   |  | NE         | 8589 GLUPE,67<br>3559 PERESSE,65  | 2744 GAUDIN,67<br>3819 VAN DER NIEL,69   |  |
| H2                    | 2824 KHARE,66<br>2827 KHARE,67<br>2913 MILLER,67<br>3344 CARTWRIGHT,68<br>3883 PROK,69 | 2886 KHARE,66<br>2773 CARTWRIGHT,67<br>2914 ROZSNYAI,67<br>3545 TRAJMAR,68 |  | NA         | 3619 ZAPESCHNYI,69  |  |  |
| H2                    | 1 2914 ROZSNYAI,67   | 3842 PEEK,69   |  | NA         | 1 2977 PEART,68   |  |  |
| O2                    | 3574 TAKAYANAGI,67   |  |  | HG         | 1 3408 MARTIN,68  |  |  |
| O2                    | 1 2828 SARAPH,66   |  |  | AR         | 8613 BENNETT,66<br>2123 HANMER,67<br>2899 MELTON,67<br>3843 DOLGOV-SAVELEV,68<br>3819 VAN DER NIEL,69                                     | 2128 SRINIVASAN,67<br>2744 GAUDIN,67<br>3569 PERESSE,65<br>3767 MERCER,67  |  |
| H2                    | 2914 ROZSNYAI,67   |  |  | K          | 2715 KORCHEVOI,67   | 3699 ZAPESCHNYI,69   |  |
| H2O                   | 3823 MILLER,69   |  |  | K          | 1 2977 PEART,68   |  |  |
| ELECTRON DETACHMENT   |  | EXPERIMENTAL   |  | CA         | 2713 MCFARLAND,67   |  |  |
| NORMALIZED            |  |  |  | CU         | 2729 PAVLOV,67  | 2917 CRAWFORD,67   |  |
| H -                   | 2788 DANCE,67  | 2984 TISONE,68   |  | KR         | 1851 SRINIVASAN,67  | 3569 PERESSE,65  |  |
| O -                   | 2984 TISONE,68   |  |  | RB         | 1919 ZAPESCHNYI,66<br>3619 ZAPESCHNYI,69  | 2715 KORCHEVOI,67  |  |
| ELECTRON DETACHMENT   |  | THEORETICAL  |  | SR         | 2713 MCFARLAND,67   |  |  |
| NORMALIZED            |  |  |  | AG         | 2729 PAVLOV,67<br>2917 CRAWFORD,67  | 2825 CRAWFORD,66<br>2918 CRAWFORD,67   |  |
| H -                   | 2116 MOSALSKI,68   | 3419 INOKUTI,68  |  | XE         | 3549 PERESSE,65   |  |  |
| DE-EXCITATION         |  | EXPERIMENTAL   |  | CS         | 2715 KORCHEVOI,67<br>3619 ZAPESCHNYI,69   | 3455 NYGAARD,68  |  |
| NORMALIZED            |  |  |  | BA         | 2713 MCFARLAND,67   |  |  |
| HE *                  | 2698 KHAJIN,66   |  |  | HA         | 1 1216 PEART,68   |  |  |
| RELATIVE              |  |  |  | TL         | 2713 MCFARLAND,67   |  |  |
| H2 *                  | 2646 BURTON,67   | 3871 BURTON,66   |  | PB         | 2729 PAVLOV,67  | 3643 HANG,69   |  |
| H2 *                  | 3543 BURTON,68   |  |  | H2         | 2954 MCCONNAN,68  |  |  |
| DE-EXCITATION         |  | THEORETICAL  |  | O2         | 3824 NISHIMURA,68<br>3347 KOROL,68<br>3578 SKUBENICH,68   | 3864 SKUBENICH,67<br>3527 PERESSE,67<br>3768 MCCONKEY,69   |  |
| NORMALIZED            |  |  |  | H2         | 1214 MCCONKEY,67<br>1963 HAYAKAWA,65<br>2923 FOWLER,67<br>3824 NISHIMURA,68<br>1864 SKUBENICH,67<br>3527 PERESSE,67<br>3769 SRIVASTAVA,69 | 1881 DALY,66<br>2785 HOLLAND,67<br>2964 SRIVASTAVA,68<br>3851 SRINIVASAN,67<br>3524 SRIVASTAVA,68<br>3718 STANTON,69 |  |
| DE-EXCITATION         |  | THEORETICAL  |  | H2O        | 3212 COMET,67   |  |  |
| NORMALIZED            |  |  |  | C2H2       | 2744 GAUDIN,67  |  |  |
| H *                   | 2863 PURCELL,82  |  |  | C O2       | 3824 NISHIMURA,68<br>3527 PERESSE,67  | 3246 MCCONKEY,68   |  |
| IONIZATION            |  | EXPERIMENTAL   |  | C O        | 2128 SRINIVASAN,67<br>3176 SKUBENICH,67   | 3864 SKUBENICH,67  |  |
| NORMALIZED            |  |  |  | C HA       | 2399 MELTON,67  | 3527 PERESSE,67  |  |
| H                     | 2784 MCCONNAN,68   | 2959 MCCONNAN,68   |  | RELATIVE   |   |  |  |
| HE                    | 1942 ANDERTSON,67<br>2746 GAUDIN,67<br>3569 PERESSE,65                                 | 2698 HEAVY,67<br>3841 HOUTATA NOUSSA,67<br>3819 VAN DER NIEL,69            |  | HE         | 3531 KRIST,68<br>3839 MARCHAND,69   | 3747 EMMERD,69   |  |
| HE *                  | 3580 LONG,67   |  |  | H          | 1 1881 DALY,66  |  |  |
| L2                    | 3863 ALEXANDER,67  | 3699 ZAPESCHNYI,68   |  | HE         | 2960 FIOUET-FAYARD,68   |  |  |
| LI                    | 1 2771 HARTING,67  | 3296 PEART,68  |  | AR         | 8998 MAGSTRUM,36<br>3839 MARCHAND,69  | 2349 SCHWAN,66   |  |
| C                     | 8549 GLUPE,67  |  |  | CA         | 2648 KUMPIYANOV,68  |  |  |
| H                     | 8549 GLUPE,67  |  |  | ZN         | 2768 ZIESEL,67  | 2960 FIOUET-FAYARD,68  |  |
| O                     | 8549 GLUPE,67  |  |  | GE         | 2964 LIN,67   |  |  |
|                       |  |  |  | HR         | 8998 MAGSTRUM,36<br>2762 ZIESEL,67  | 2349 SCHWAN,66<br>2767 MEHLHORN,65   |  |
|                       |  |  |  | HR         | 1 3768 LATYPOV,68   |  |  |
|                       |  |  |  | QB         | 2368 SHIMON,64<br>2960 FIOUET-FAYARD,68   | 2762 ZIESEL,67   |  |



| DISSOCIATION            |                     | EXPERIMENTAL      | DISSOCIATIVE IONIZATION |                     | EXPERIMENTAL           |
|-------------------------|---------------------|-------------------|-------------------------|---------------------|------------------------|
| NORMALIZED              |                     |                   | RELATIVE                |                     |                        |
| N2                      | 2945 DE MEER, 67    | 3831 VROOM, 69    | C H4                    | 2658 BRENN, 67      |                        |
| N2                      | 1 2171 DUNN, 67     | 2798 DANCE, 67    | O2                      | 2647 KIEFFER, 67    | 3023 FIGUET-FAYARD, 68 |
| O2                      | 2782 SPOKA, 67      |                   | S F6                    | 2215 DIEBELER, 48   |                        |
| O2                      | 1 2772 VAN ZYL, 67  |                   | C H3CL                  | 2731 GUTBIER, 54    |                        |
| N2                      | 3833 SPOKA, 69      |                   | C H3RR                  | 2731 GUTBIER, 54    |                        |
| N2                      | 1 2772 VAN ZYL, 67  |                   | C F4                    | 2215 DIEBELER, 48   |                        |
| H2O                     | 3812 VROOM, 69      |                   | SI F4                   | 2215 DIEBELER, 48   |                        |
| C O2                    | 3759 CORVIN, 69     |                   | H2OR2                   | 2731 GUTBIER, 54    |                        |
| C H4                    | 2849 MFLTON, 67     | 3832 VROOM, 69    | H2CL2                   | 2731 GUTBIER, 54    |                        |
| O2                      | 3831 VROOM, 69      |                   | PI2                     | 2988 KOHL, 67       |                        |
| O2                      | 1 2171 DUNN, 67     |                   |                         |                     |                        |
| C2H4                    | 3832 VROOM, 69      |                   | DISSOCIATIVE IONIZATION |                     | THEORETICAL            |
| C2H6                    | 3832 VROOM, 69      |                   | RELATIVE                |                     |                        |
| C O4                    | 3832 VROOM, 69      |                   | H2                      | 1984 MCCULLOH, 68   |                        |
| RELATIVE                |                     |                   |                         |                     |                        |
| N2                      | 3881 LEVENTHAL, 67  | 3756 CLAMPITT, 69 | RADIATIVE CAPTURE       |                     | EXPERIMENTAL           |
| N2                      | 2737 NIEHAUS, 67    |                   | NORMALIZED              |                     |                        |
| N2                      | 2 1881 DALY, 66     |                   | CS                      | 1 2888 AGNEW, 66    |                        |
| H2O                     | 3285 FREUND, 67     | 3756 CLAMPITT, 69 |                         |                     |                        |
| C O2                    | 3285 FREUND, 67     |                   |                         |                     |                        |
| DISSOCIATION            |                     | THEORETICAL       | ROTATIONAL EXCITATION   |                     | EXPERIMENTAL           |
| NORMALIZED              |                     |                   | NORMALIZED              |                     |                        |
| N2                      | 3344 CARTWRIGHT, 68 |                   | H2                      | 3252 EMHARDT, 68    |                        |
| N2                      | 1 2218 PETH, 67     | 2491 LANE, 67     |                         |                     |                        |
|                         | 2486 OKSTUN, 67     | 1842 PETH, 69     |                         |                     |                        |
| FREE-FREE EMISSION      |                     | THEORETICAL       | ROTATIONAL EXCITATION   |                     | THEORETICAL            |
| NORMALIZED              |                     |                   | NORMALIZED              |                     |                        |
| N                       | 2211 MJOLNESS, 67   |                   | H2                      | 1993 LANE, 67       | 2824 SAMPSON, 63       |
| O                       | 2211 MJOLNESS, 67   |                   |                         | 3025 ARDILL, 68     | 3349 LANE, 68          |
|                         |                     |                   |                         | 3886 ABRAH, 69      | 3828 CHANG, 69         |
|                         |                     |                   |                         | 1843 MERRY, 69      |                        |
| DISSOCIATIVE IONIZATION |                     | EXPERIMENTAL      | H2                      | 2824 SAMPSON, 63    |                        |
| NORMALIZED              |                     |                   | H CL                    | 3787 ITIHAWA, 69    |                        |
|                         |                     |                   | C H                     | 1786 TAKAYANAGI, 68 | 3787 ITIHAWA, 69       |
|                         |                     |                   |                         |                     |                        |
| VIBRATIONAL EXCITATION  |                     | EXPERIMENTAL      | NORMALIZED              |                     |                        |
| O2                      | 2782 SPOKA, 67      | 3527 PERESSI, 67  | H2                      | 3377 EMHARDT, 68    |                        |
| N2                      | 1881 DALY, 66       | 3527 PERESSI, 67  | C O2                    | 3749 BOWEST, 68     |                        |
|                         | 3831 SPOKA, 69      |                   | C O                     | 3377 EMHARDT, 68    |                        |
| C2H2                    | 2744 SAUDER, 67     |                   | RELATIVE                |                     |                        |
| C O2                    | 3527 PERESSI, 67    |                   | H2                      | 1977 PERESSI, 66    |                        |
| C H4                    | 2849 MFLTON, 67     | 3527 PERESSI, 67  | O2                      | 3846 SEIBERLE, 68   |                        |
| RELATIVE                |                     |                   | H2                      | 3343 MALL, 68       | 3846 SEIBERLE, 68      |
| H2                      | 2647 KIEFFER, 67    |                   | H2O                     | 3847 SEIBERLE, 68   |                        |
| O2                      | 2388 TURNER, 67     |                   |                         |                     |                        |
| N2                      | 2614 KIEFFER, 67    |                   |                         |                     |                        |
| C O2                    | 2119 SJOBERG, 68    |                   |                         |                     |                        |

| VIBRATIONAL EXCITATION  |                                   |                                    | EXPERIMENTAL | DISSOCIATIVE ATTACHMENT |   |  | EXPERIMENTAL |
|-------------------------|-----------------------------------|------------------------------------|--------------|-------------------------|---|--|--------------|
| RELATIVE                |                                   |                                    |              | RELATIVE                |   |  |              |
| N O                     | 3546 SKERBELE,68                  |                                    |              | LI CL                   | 2918 ERINGHAUS,64   |  |              |
| C O2                    | 3547 SKERBELE,68                  | 3778 ANDRICK,69                    |              | SI CL4                  | 2786 VOUGHT,47  | 3641 JAGER,68  |              |
| C O                     | 3546 SKERBELE,68                  |                                    |              | M2SE                    | 2738 MEUERT,53  |  |              |
|                         |                                   |                                    |              | TL CL                   | 3416 KHVOSTENKO,64  |  |              |
|                         |                                   |                                    |              | TL BR                   | 3416 KHVOSTENKO,65  |  |              |
|                         |                                   |                                    |              | IN BR                   | 3417 KHVOSTENKO,64  |  |              |
| VIBRATIONAL EXCITATION  |                                   |                                    | THEORETICAL  | DISSOCIATIVE ATTACHMENT |   |  | THEORETICAL  |
| NORMALIZED              |                                   |                                    |              | NORMALIZED              |   |  |              |
| M2                      | 2884 BARDLEY,66<br>2824 BREIG,66  | 2798 TAKAYANAGI,65<br>3886 ARAM,69 |              | M2                      | 2884 BARDLEY,66   |  |              |
| M2 1                    | 3684 BOIKOVA,68                   |                                    |              |                         |   |  |              |
| M2                      | 2824 BREIG,66                     |                                    |              |                         |   |  |              |
| N O                     | 2769 LIN,64                       |                                    |              |                         |   |  |              |
| C O                     | 2769 LIN,64                       | 2824 BREIG,66                      |              |                         |   |  |              |
| ME M 1                  | 3684 BOIKOVA,68                   |                                    |              |                         |   |  |              |
| DISSOCIATIVE ATTACHMENT |                                   |                                    | EXPERIMENTAL | TOTAL SCATTERING        |   |  | EXPERIMENTAL |
| NORMALIZED              |                                   |                                    |              | NORMALIZED              |   |  |              |
| M2                      | 2763 SCHULZ,67                    |                                    |              | ME                      | 2327 RAMSAUER,31<br>2433 CROMPTON,67<br>2986 POLUSHKIN,66<br>2957 CAVALLAS,67<br>3568 VOLKOV,68 | 2326 NY,37<br>2448 BALDWIN,67<br>2956 POLUSHKIN,66<br>3284 TICE,67<br>3782 HOFFMANN,69 |              |
| O2                      | 3841 HENDERSON,69                 |                                    |              | N                       | 2753 HIRMAN,67  |  |              |
| M2O                     | 2884 BAILEY,38                    |                                    |              | O                       | 1945 DAIDER,66<br>2178 SUNSHINE,65  | 2178 SUNSHINE,67   |              |
| M M3                    | 2884 BAILEY,38<br>3763 COMPTON,68 | 3287 SHARP,68                      |              | ME                      | 2326 RAMSAUER,31<br>2957 CAVALLAS,67<br>3782 HOFFMANN,69  | 2326 NY,37<br>3568 VOLKOV,68   |              |
| M2O                     | 3845 CHANEY,69                    |                                    |              | AR                      | 1945 DAIDER,66<br>2328 NY,37<br>2986 POLUSHKIN,66<br>2957 CAVALLAS,67<br>3568 VOLKOV,68         | 2327 RAMSAUER,31<br>2448 BALDWIN,67<br>2956 POLUSHKIN,66<br>3284 TICE,67               |              |
| M CL                    | 2884 BAILEY,38                    | 3887 CHRISTOPHORO,68               |              | K                       | 2956 POLUSHKIN,66   |  |              |
| C M4                    | 2285 SHARP,67                     | 2899 WELTON,67                     |              | MR                      | 2326 RAMSAUER,31<br>3782 HOFFMANN,69  | 3568 VOLKOV,68   |              |
| C CL4                   | 3886 CHRISTOPHORO,68              |                                    |              | HE                      | 2326 RAMSAUER,31<br>3782 HOFFMANN,69  | 3568 VOLKOV,68   |              |
| M O                     | 2763 SCHULZ,67                    |                                    |              | CS                      | 2986 POLUSHKIN,66   |  |              |
| O2                      | 2763 SCHULZ,67                    |                                    |              | M2                      | 2127 RAMSAUER,31  | 3284 TICE,67   |              |
| M I                     | 3887 CHRISTOPHORO,68              |                                    |              | O2                      | 2878 CHANEY,66<br>2178 SUNSHINE,65  | 2178 SUNSHINE,67   |              |
| M BR                    | 3887 CHRISTOPHORO,68              |                                    |              | K2                      | 1997 GOLDEN,66<br>3284 TICE,67  | 2326 RAMSAUER,31   |              |
| C O4                    | 2285 SHARP,67                     |                                    |              | M2O                     | 2884 BAILEY,38  | 3283 TICE,67   |              |
| M O3                    | 3287 SHARP,68                     | 3763 COMPTON,68                    |              | M M3                    | 2884 BAILEY,38  | 3283 TICE,67   |              |
| C CL3F                  | 3886 CHRISTOPHORO,68              |                                    |              | M2O                     | 3283 TICE,67  |  |              |
| CL2F2                   | 3886 CHRISTOPHORO,68              |                                    |              | C O2                    | 2326 RAMSAUER,31  | 3283 TICE,67   |              |
| O CL                    | 3887 CHRISTOPHORO,68              |                                    |              | C O                     | 2326 RAMSAUER,31  | 3283 TICE,67   |              |
| O BR                    | 3887 CHRISTOPHORO,68              |                                    |              | M CL                    | 2884 BAILEY,38  |  |              |
| O I                     | 3887 CHRISTOPHORO,68              |                                    |              | C M4                    | 2326 RAMSAUER,31  | 3284 TICE,67   |              |
| RELATIVE                |                                   |                                    |              | O2                      | 3284 TICE,67  |  |              |
| M2                      | 2977 DOWELL,68                    |                                    |              | S O2                    | 3283 TICE,67  |  |              |
| M M3                    | 2975 KRAUS,61                     |                                    |              | M C M                   | 3283 TICE,67  |  |              |
| M O                     | 3282 CHANEY,68                    |                                    |              | C M4                    | 3284 TICE,67  |  |              |
| C O2                    | 2975 KRAUS,61                     |                                    |              | O2                      | 3284 TICE,67  |  |              |
| C O                     | 3282 CHANEY,68                    | 3834 BEMPT,68                      |              | S O2                    | 3283 TICE,67  |  |              |
| MA CL                   | 2918 ERINGHAUS,64                 |                                    |              | M C M                   | 3283 TICE,67  |  |              |
| M21                     | 2738 MEUERT,53                    | 2975 KRAUS,61                      |              | C M4                    | 3284 TICE,67  |  |              |
| C I2                    | 2975 KRAUS,61                     |                                    |              | C O4                    | 3284 TICE,67  |  |              |
| S M4                    | 8746 BUCHHELMER,68                |                                    |              |                         |   |  |              |
| S O2                    | 2975 KRAUS,61                     |                                    |              |                         |   |  |              |

# POSITRON PAPERS

## ELASTIC SCATTERING

## THEORETICAL

### NORMALIZED

|    |                   |                   |
|----|-------------------|-------------------|
| H  | 2812 BRANSDEN, 66 | 2859 HOUSTON, 68  |
|    | 2774 FELS, 67     | 2959 CALLAWAY, 68 |
|    | 3892 DRACHMAN, 67 | 3358 DRACHMAN, 68 |
|    | 1781 GARRETT, 69  | 3848 RANMAN, 69   |
| HE | 2859 HOUSTON, 68  | 2959 CALLAWAY, 68 |
|    | 3892 DRACHMAN, 67 | 3853 KRATOV, 67   |

## ELECTRONIC EXCITATION

## THEORETICAL

### NORMALIZED

|   |                  |
|---|------------------|
| H | 2937 DARBURG, 66 |
|---|------------------|

## IONIZATION

## THEORETICAL

### NORMALIZED

|    |                   |
|----|-------------------|
| HE | 3827 FERRANTE, 69 |
|----|-------------------|

## ROTATIONAL EXCITATION

## THEORETICAL

### NORMALIZED

|    |                     |
|----|---------------------|
| H2 | 2783 TAKAYAMAGI, 67 |
| H2 | 2783 TAKAYAMAGI, 67 |

#### IV. BIBLIOGRAPHIC REFERENCES

# BIBLIOGRAPHIC REFERENCES

- 550 HAGSTRUM H D  
METASTABLE IONS OF THE NOBLE GASES  
PHYS REV, VOL 104, 309-316, (1956)
- 584 HENRY R J W  
ELASTIC SCATTERING FROM ATOMIC OXYGEN AND PHOTODETACHMENT FROM O-  
PHYS REV, VOL 162, 56-63, (1967)
- 589 GLUPE G, MEHLHORN W  
A NEW METHOD FOR MEASURING ELECTRON IMPACT IONIZATION CROSS SECTIONS OF INNER SHELLS  
PHYS LETTERS, VOL 25A, 274-275, (1967)
- 613 BENNETT M R, MERCER G N, KINDLMANN P J, WEXLER P, MYMAN H  
DIRECT ELECTRON EXCITATION CROSS SECTIONS PERTINENT TO THE ARGON ION LASER  
PHYS REV LETTERS, VOL 17, 987, (1966)
- 746 BUCHELNIKOVA N S  
DETERMINATION OF THE ATTACHMENT CROSS SECTIONS FOR SLOW ELECTRONS IN MOLECULES  
INSTR EXP TECH USSR ENGLISH TRANSL, VOL 6, 803, (1958)
- 877 ANDERSON R J  
EXCITATION OF MERCURY ATOMS BY ELECTRON IMPACT  
THESIS, UNIVERSITY OF OKLAHOMA, 1966, 105 PAGES, UNIVERSITY MICROFILMS INC, ANN ARBOR, MICHIGAN, NO. 66-14,192
- 878 GINGO P J  
ELECTRON-ATOM COLLISIONS WITH POLARIZATION AND EXCHANGE EFFECTS INCLUDED  
THESIS, UNIVERSITY OF CALIFORNIA, LOS ANGELES, 1966, 140 PAGES, UNIVERSITY MICROFILMS INC, ANN ARBOR, MICHIGAN, NO. 67-550
- 893 SHEPPARD R J  
SCATTERING OF SLOW ELECTRONS FROM THE NITROGEN MOLECULE  
THESIS, HOWARD UNIVERSITY, 1966, 77 PAGES, UNIVERSITY MICROFILMS INC, ANN ARBOR, MICHIGAN, NO. 66-12,475
- 1138 BELY O, PETRINI D  
THE EXCITATION CROSS SECTION  $Q(4S - 3D)$  IN CA II  
PHYS LETTERS, VOL 23, 442, (1966)
- 1139 THOMPSON D G  
THE ELASTIC SCATTERING OF SLOW ELECTRONS BY NEON AND ARGON  
PROC ROY SOC LONDON SER A, VOL 294, 168, (1966)
- 1148 SIMPSON J A, MENENDEZ M G, NIELCZAREK S R  
ANGLE AND CHANNEL DEPENDENCE OF RESONANCES IN E- / HE SCATTERING NEAR 60 EV  
PHYS REV, VOL 158, 76, (1966)
- 1159 VRIENS L  
CALCULATION OF ABSOLUTE IONISATION CROSS SECTIONS OF HE, HE\*, HE+, NE, NE\*, NE+, AR, AR\*, HG AND HG\*  
PHYS LETTERS, VOL 8, 260, (1964)
- 1168 ABRINES R, PERCIVAL I C, VALENTINE M A  
CLASSICAL CROSS SECTIONS FOR IONIZATION OF HYDROGEN ATOMS BY ELECTRONS  
PROC PHYS SOC LONDON, VOL 89, 515, (1966)
- 1169 KRAIDY M, FRASER P A  
ITERATION AND ITERATION-VARIATION METHODS FOR THE ELASTIC SCATTERING OF ELECTRONS BY ATOMS  
PROC PHYS SOC LONDON, VOL 89, 525, (1966)
- 1171 CROTHERS D, MCCARROLL R  
EXCITATION OF NEUTRAL ATOMS BY ELECTRON IMPACT  
PROC PHYS SOC LONDON, VOL 96, 753, (1965)
- 1178 BASU R, SIL N C  
ELECTRON COLLISION WITH CAESIUM ATOM  
INDIAN J PHYS, VOL 40, 233, (1966)
- 1182 BANERJEE S N, JHA R, SIL N C  
VARIATIONAL TREATMENT OF SLOW ELECTRON SCATTERING BY A HELIUM ATOM  
INDIAN J PHYS, VOL 40, 258, (1966)
- 1183 BATES D R, BOYD A H, PRASAD S S  
IMPACT IONIZATION OF SODIUM  
PROC PHYS SOC LONDON, VOL 85, 1121, (1965)
- 1214 MCCONKEY J W, WOOLSEY J M, BURNS D J  
ABSOLUTE CROSS SECTION FOR ELECTRON IMPACT EXCITATION OF 3914 ANGSTROM (N2)+  
PLANETARY SPACE SCI, VOL 15, 1332-1334, (1967)
- 1364 HUSAIN D, CHOUDHURY A L, RAFIQUILLAH A K, NESTOR C W, MALIK F B  
ELASTIC SCATTERING OF LOW-ENERGY ELECTRONS BY METASTABLE HE IN THE POLARIZED-CORE DISTORTED-WAVE APPROXIMATION  
PHYS REV, VOL 161, 68-73, (1967)
- 1881 DALY M R, POWELL R E  
ELECTRON COLLISIONS IN NITROGEN  
PROC PHYS SOC LONDON, VOL 89, 273, (1966)
- 1888 PERESSE J  
SECTIONS EFFICACES TOTALES D'IONISATION, PAR IMPACTS ELECTRONIQUES, DE MOLECULES POLYATOMIQUES  
METHODES PHYS D'ANALYSE (GAMS), PAGE 34, (1965)

PRECEDING PAGE BLANK

|      |  |  |
|------|--|--|
| 1889 | CAMILL P, SCHWARTZ R,<br>JETTE A N               | POLARIZATION OF LIGHT EMITTED FROM THE EXCITATION OF H <sub>2</sub> BY<br>ELECTRON IMPACT<br>PHYS REV LETTERS, VOL 19, 283-284, (1967)   |
| 1904 | GUPTA S B, SIL N C                               | ELASTIC SCATTERING OF ELECTRONS BY HYDROGEN ATOM<br>INDIAN J PHYS, VOL 41, 163-170, (1967)   |
| 1941 | JOACHAIN C J, MITTLEMAN M H                      | REARRANGEMENT COLLISIONS. II. ELECTRON EXCITATION OF<br>HE (2 TRIPLET P)<br>PHYS REV, VOL 151, 7, (1966)   |
| 1942 | ANDERSON R J, LEE E T P,<br>LIN C C              | OPTICAL IONIZATION-EXCITATION FUNCTIONS OF HELIUM BY<br>ELECTRON IMPACT<br>PHYS REV, VOL 160, 20-22, (1967)  |
| 1944 | BALLING L C                                      | SODIUM-ELECTRON SPIN-EXCHANGE COLLISIONS<br>PHYS REV, VOL 151, 1, (1966)   |
| 1945 | DAIWER J W, WALDRON H F                          | SCATTERING CROSS SECTIONS OF ARGON AND ATOMIC OXYGEN TO<br>THERMAL ELECTRONS<br>PHYS REV, VOL 151, 51, (1966)  |
| 1946 | PLUTA K H, MCDOWELL M P C                        | ELECTRON-IMPACT-INDUCED N TO N PRIME TRANSITIONS IN H ATOMS<br>PROC PHYS SOC LONDON, VOL 89, 299, (1966)   |
| 1951 | MCDOWELL M R C                                   | CLASSICAL IMPULSE APPROXIMATIONS<br>PROC PHYS SOC LONDON, VOL 89, 23, (1966)   |
| 1968 | HAYAKAWA S, KUMAZAKI T,<br>NISHIHURA H, OTSUKA H | MEASUREMENT OF THE EXCITATION FUNCTION OF (N <sub>2</sub> ) <sup>+</sup> FIRST<br>NEGATIVE BANDS BY ELECTRON IMPACT<br>REPT IONOSPHERE SPACE RES JAPAN, VOL 19, 311, (1965)              |
| 1969 | ZAPESCHNYI I P, SHIMON L L                       | EFFECTIVE CROSS SECTIONS FOR THE EXCITATION OF ALKALI-METAL<br>ATOMS BY SLOW ELECTRON COLLISIONS. III. RUBIDIUM<br>OPT SPECTRY USSR ENGLISH TRANSL, VOL 20, 525, (1966)                  |
| 1970 | VELORE V, LYASH A V,<br>RABIK L L, FRIDKIN L A   | TOTAL EFFECTIVE CROSS SECTIONS OF EXCITATION OF ATOMS BY<br>ELECTRON IMPACT, USING A CLASSICAL APPROXIMATION<br>LATVIJAS PSR ZINATNU AKAD VESTIS, NO. 4, 3, (1965)                       |
| 1976 | ORMONDE S, SMITH K                               | NOTE ON THE INELASTIC SCATTERING OF LOW ENERGY ELECTRONS<br>BY HYDROGEN ATOMS<br>REPORT, 6-90-63-25, LOCKHEED MISSILES AND SPACE COMPANY,<br>PALO ALTO, CALIFORNIA, 22 PAGES, 1963       |
| 1977 | MENENDEZ M G, HOLT H K                           | RESONANCES IN INELASTIC ELECTRON SCATTERING FROM H <sub>2</sub><br>J CHEM PHYS, VOL 45, 2743, (1966)   |
| 1988 | BOGDANOVA I P, MARUSIN V D                       | OPTICAL EXCITATION FUNCTIONS OF MERCURY LINES USING A<br>COINCIDENCE METHOD<br>OPT SPECTRY USSR ENGLISH TRANSL, VOL 21, 148, (1966)  |
| 1989 | ZAPESCHNYI I P, SKUBENICH V V                    | THE CROSS SECTIONS FOR THE EXCITATION OF MOLECULAR<br>NITROGEN LEVELS BY ELECTRON COLLISION<br>OPT SPECTRY USSR ENGLISH TRANSL, VOL 21, 83, (1966)                                       |
| 1990 | ALEKSAKHIN I S, ZAPESCHNYI I P                   | ON THE EXCITATION FUNCTIONS OF LITHIUM SPECTRAL LINES<br>OPT SPECTRY USSR ENGLISH TRANSL, VOL 21, 77, (1966)   |
| 1992 | BELY O   | ON THE EXCHANGE CONTRIBUTION IN THE SCATTERING OF ELECTRONS<br>BY ATOMS AND POSITIVE IONS<br>NUOVO CIMENTO, VOL 49, 66, (1967)   |
| 1993 | LANE N F, GELTMAN S                              | ROTATIONAL EXCITATION OF DIATOMIC MOLECULES BY SLOW<br>ELECTRONS - APPLICATION TO H <sub>2</sub><br>PHYS REV, VOL 160, 53-67, (1967)   |
| 1997 | GOLDEN D E                                       | LOW-ENERGY RESONANCES IN ELECTRON-H <sub>2</sub> TOTAL SCATTERING<br>CROSS SECTIONS - THE TEMPORARY FORMATION OF (N <sub>2</sub> ) <sup>-</sup><br>PHYS REV LETTERS, VOL 17, 847, (1966) |
| 1999 | BURKE P G, ORMONDE S,<br>WHITAKER M              | THRESHOLD BEHAVIOR OF THE N = 2 EXCITATION CROSS SECTION<br>IN ATOMIC HYDROGEN<br>PHYS REV LETTERS, VOL 17, 880, (1966)  |
| 2004 | BARDSLEY J N, HERZENBERG A,<br>HANDL F           | VIBRATIONAL EXCITATION AND DISSOCIATIVE ATTACHMENT IN THE<br>SCATTERING OF ELECTRONS BY HYDROGEN MOLECULES<br>PROC PHYS SOC LONDON, VOL 89, 321, (1966)                                  |
| 2005 | PU R T, CHANG E S                                | MODIFIED OPTICAL-POTENTIAL APPROACH TO LOW-ENERGY<br>ELECTRON-HELIUM SCATTERING<br>PHYS REV, VOL 151, 31, (1966)   |

- 2012 BRANSOEN B H, JUNDI Z  
POSITRON SCATTERING BY HYDROGEN AND THE ADIABATIC  
POTENTIAL  
PROC PHYS SOC LONDON, VOL 89, 7, (1966)
- 2013 STAUFFER A D, MCDONELL M R C  
AN IMPACT PARAMETER TREATMENT OF THE EXCITATION OF ATOMS  
BY CHARGED PARTICLES  
PROC PHYS SOC LONDON, VOL 89, 289, (1966)
- 2016 BREIG E L, LIN C C  
EXCITATION OF THE SPIN MULTIPLETS OF THE GROUND STATE OF  
OXYGEN BY SLOW ELECTRONS  
PHYS REV, VOL 151, 67, (1966)
- 2017 VRIENS L  
EXCITATION OF HELIUM BY ELECTRONS AND PROTONS  
PHYS REV, VOL 160, 100-108, (1967)
- 2020 SARAPH H E, SEATON M J,  
SHEMMING J  
ELECTRON COLLISIONS WITH IONS IN (2P)2 CONFIGURATIONS  
PROC PHYS SOC LONDON, VOL 89, 27, (1966)
- 2021 MILS D, KLEINPOPPEN H,  
KOSCHMIEDER H  
REMEASUREMENT OF THE TOTAL CROSS SECTION FOR EXCITATION  
OF THE HYDROGEN 2 DOUBLET S 1/2 STATE BY ELECTRON IMPACT  
PROC PHYS SOC LONDON, VOL 89, 35, (1966)
- 2022 MORPISON D J T, RUDGE M R H  
THE EXCITATION OF ATOMIC HYDROGEN BY ELECTRON IMPACT  
PROC PHYS SOC LONDON, VOL 89, 45, (1966)
- 2023 KINGSTON A F  
CLASSICAL ELECTRON IONIZATION CROSS SECTIONS  
PROC PHYS SOC LONDON, VOL 89, 177, (1966)
- 2024 KHARE S P  
EXCITATION OF HYDROGEN MOLECULES BY ELECTRON IMPACT  
PHYS REV, VOL 149, 33, (1966)
- 2027 TEMKIN A, VASAVADA K V  
SCATTERING OF ELECTRONS FROM (H2)+ - THE METHOD OF POLARIZED  
SINGLE-CENTER ORBITALS  
PHYS REV, VOL 160, 109-117, (1967)
- 2057 SHINIZU H  
TWO CENTRE COULOMB POTENTIAL APPROXIMATION  
J PHYS SOC JAPAN, VOL 18, 811, (1963)
- 2059 HOUSTON S K, MOISEWITSCH B L  
ELASTIC SCATTERING OF ZERO-ENERGY POSITRONS BY HYDROGEN  
AND HELIUM ATOMS  
J PHYS B PROC PHYS SOC, VOL 1, 29-33, (1968)
- 2060 ROBINSON E J, GELTMAN S  
SINGLE- AND DOUBLE-QUANTUM PHOTODETACHMENT OF NEGATIVE IONS  
PHYS REV, VOL 153, 4, (1967)
- 2063 PURCELL E M  
THE LIFETIME OF THE 2 DOUBLET S 1/2 STATE OF HYDROGEN  
IN AN IONIZED ATMOSPHERE  
ASTROPHYS J, VOL 116, 457, (1952)
- 2065 PRESNYAKOV L, SOBELMAN I,  
VAINSHTEIN L A  
ON THE EXCITATION OF NEUTRAL ATOMS BY ELECTRON IMPACT  
PROC PHYS SOC LONDON, VOL 89, 511, (1966)
- 2066 KHARE S P  
EXCITATION OF HYDROGEN MOLECULES BY ELECTRON IMPACT.  
II. EXCITATION OF D(3P PI SINGLET PI UNGRADE) STATE  
PHYS REV, VOL 152, 74, (1966)
- 2067 OMIOVAR K  
THEORY OF THE 2S AND 2P EXCITATION OF THE HYDROGEN ATOM  
INDUCED BY ELECTRON IMPACT  
NASA TN D-2145, GODDARD SPACE FLIGHT CENTER, GREENBELT,  
MARYLAND, 1964, 47 PAGES
- 2069 ZAPESCHNYI I P, SHIMON L L  
EFFECTIVE EXCITATION CROSS SECTIONS OF ALKALI-METAL ATOMS  
COLLIDING WITH SLOW ELECTRONS. V. RESONANCE LEVELS  
OPT SPECTRY USSR ENGLISH TRANSL, VOL 21, 155, (1966)
- 2070 HASHINO T  
ZERO-ENERGY ELASTIC SCATTERING LENGTH OF POSITRONS FROM  
HELIUM ATOMS  
PROGR THEORET PHYS KYOTO, VOL 36, 671, (1966)
- 2071 GARRETT W R, JACKSON M T  
ELECTRON PHOTODETACHMENT FROM O- AND ELASTIC SCATTERING  
FROM ATOMIC OXYGEN  
PHYS REV, VOL 153, 28, (1967)
- 2072 SOLTYSIK E A, FOURNIER A Y,  
GRAY R L  
POLARIZATION OF LIGHT FROM E-/HE COLLISIONS  
PHYS REV, VOL 153, 152, (1967)
- 2074 ZAPESCHNYI I P, SHPENIK O B  
ATOMIC EXCITATION BY MONOENERGETIC ELECTRON BEAMS  
SOVIET PHYS JETP ENGLISH TRANSL, VOL 23, 592, (1966)
- 2075 LAWSON J, MASSEY M S W,  
WALLACE J, WILKINSON D  
DISPERSION RELATIONS AND THE ELASTIC SCATTERING OF ELECTRONS  
BY HELIUM ATOMS  
PROC ROY SOC LONDON SER A, VOL 294, 149, (1966)

- 2076 KODTEKANANI S H  
EXCITATION CROSS SECTION OF SOME OF THE STATES OF NE II,  
AR II, AND KR II BY ELECTRON COLLISION  
IEEE J QUANTUM ELECTRON, VOL 2, 770, (1966)
- 2077 ONIDVAR K  
VAINSHTEIN METHOD APPLIED TO ELECTRON IMPACT EXCITATION  
AND IONIZATION OF ATOMS  
PHYS REV LETTERS, VOL 18, 153, (1967)
- 2078 CHANTRY P J, PHELPS A V,  
SCHULZ G J  
THEORY OF ELECTRON COLLISION EXPERIMENTS AT INTERMEDIATE  
AND HIGH GAS DENSITIES  
PHYS REV, VOL 152, 81, (1966)
- 2088 BAILEY V A, DUNCANSON W E  
ON THE BEHAVIOUR OF ELECTRONS AMONGST THE MOLECULES N H<sub>3</sub>,  
H<sub>2</sub>O AND H CL  
PHIL MAG, VOL 18, 145, (1938)
- 2114 GUPTA S R, SIL N C  
LOW-ENERGY SCATTERING OF ELECTRON BY ATOMIC POTENTIAL WITH  
A LONG-RANGE R<sup>-4</sup> TAIL  
INDIAN J PHYS, VOL 40, 333, (1966)
- 2115 BELY F, BELY O,  
LAN V K  
THE EXCITATION OF THE GROUND CONFIGURATION OF FE XIII BY  
ELECTRON IMPACTS  
ANN ASTROPHYS, VOL 29, 343, (1966)
- 2116 ROGALSKI M  
TOTAL CROSS-SECTION FOR DETACHMENT OF AN ELECTRON BY IMPACT  
FROM H- IN ITS GROUND STATE  
ACTA PHYS POLON, VOL 29, 15, (1966)
- 2118 BELY O  
EXCITATION OF LITHIUM-LIKE IONS BY ELECTRON IMPACTS.  
II. TRANSITIONS 2S TO NS AND 2S TO ND  
ANN ASTROPHYS, VOL 29, 683, (1966)
- 2119 SJOGREN H  
FORMATION OF CARBON DIOXIDE IONS AFTER ELECTRON AND ION  
IMPACT  
ARKIV FYSIK, VOL 32, 529, (1966)
- 2120 SRINIVASAN V, REES J A  
A NOTE ON THE TOTAL IONIZATION CROSS SECTION FOR ELECTRONS  
IN THE INERT GASES AND CARBON MONOXIDE  
BRIT J APPL PHYS, VOL 18, 59, (1967)
- 2123 HAMMER J H, WEN C P  
MEASUREMENTS OF ELECTRON IMPACT EXCITATION CROSS SECTIONS  
OF LASER STATES OF ARGON (II)  
J CHEM PHYS, VOL 46, 1225, (1967)
- 2126 JHA R, BANERJEE S N,  
SIL N C  
ELASTIC AND INELASTIC SCATTERING OF ELECTRONS BY ATOMIC  
HYDROGEN IN OCHKUR APPROXIMATION  
INDIAN J PHYS, VOL 40, 491, (1966)
- 2127 BANERJEE S N, JHA R,  
SIL N C  
ELASTIC SCATTERING OF ELECTRONS BY HELIUM ATOM IN OCHKUR  
APPROXIMATION  
INDIAN J PHYS, VOL 40, 489, (1966)
- 2128 JOSE J D, SHARPTON F A,  
ST JOHN R H  
APPARENT CROSS SECTIONS OF N<sub>2</sub> FOR ELECTRON EXCITATION OF  
THE SECOND POSITIVE SYSTEM  
J OPT SOC AM, VOL 57, 186, (1967)
- 2129 JHA R, BANERJEE S N,  
SIL N C  
EFFECT OF POLARISATION ON THE ELASTIC ELECTRON SCATTERING  
BY HELIUM ATOM  
INDIAN J PHYS, VOL 40, 543, (1966)
- 2159 HOLY A R, MOISEWITSCH B L  
APPLICATION OF A SIMPLIFIED SECOND BORN APPROXIMATION TO  
THE SCATTERING OF ELECTRONS AND PHOTONS BY HYDROGEN ATOMS  
J PHYS & PROC PHYS SOC, VOL 1, 36-47, (1968)
- 2170 SUNSHINE G, AUBREY S B,  
BEDERSON B  
ABSOLUTE MEASUREMENTS OF TOTAL CROSS SECTIONS FOR THE  
SCATTERING OF LOW-ENERGY ELECTRONS BY ATOMIC AND MOLECULAR  
OXYGEN  
PHYS REV, VOL 154, 1, (1967)
- 2171 DUNN G W, VAN ZYL B  
ELECTRON IMPACT DISSOCIATION OF (H<sub>2</sub>)<sup>+</sup>  
PHYS REV, VOL 154, 40, (1967)
- 2172 DOERING J P  
LOW-ENERGY, LARGE-ANGLE ELECTRON-IMPACT SPECTRUM OF ETHYLENE  
J CHEM PHYS, VOL 46, 1194, (1967)
- 2174 KOVAL A G, KOPPE V T,  
FOGEL VA M  
EMISSION SPECTRA OF RAREFIED MOLECULAR GASES EXCITED BY  
FAST ELECTRONS  
COSMIC RES USSR ENGLISH TRANSL, VOL 4, 64, (1966)
- 2175 DUGAN J L G, RICHARDS M L,  
MUSCHLITZ E E  
EXCITATION OF THE METASTABLE STATES OF HELIUM BY ELECTRON  
IMPACT  
J CHEM PHYS, VOL 46, 346, (1967)

- 2176 DOWELL J T PRODUCTION OF METASTABLE ATOMS BY ELECTRON IMPACT  
THESIS, UNIVERSITY OF CALIFORNIA, BERKELEY, 1966, 49 PAGES,  
UNIVERSITY MICROFILMS INC, ANN ARBOR, MICHIGAN, NO. 66-8304
- 2177 SNODGRASS H R ELASTIC SCATTERING OF LOW-ENERGY ELECTRONS BY NONSPHERICAL  
ATOMS  
THESIS, UNIVERSITY OF CALIFORNIA, BERKELEY, 1966, 157 PAGES,  
UNIVERSITY MICROFILMS INC, ANN ARBOR, MICHIGAN, NO. 66-8390
- 2178 SUNSHINE G ABSOLUTE MEASUREMENTS OF TOTAL CROSS SECTIONS FOR THE  
SCATTERING OF LOW ENERGY ELECTRONS BY ATOMIC OXYGEN  
THESIS, NEW YORK UNIVERSITY, 1965, 86 PAGES, UNIVERSITY  
MICROFILMS INC, ANN ARBOR, MICHIGAN, NO. 66-5759
- 2179 EHRHARDT H, WILLMANN K DIE WINKELABHANGIGKEIT DER RESONANZSTREUUNG  
NIEDERENERGETISCHER ELEKTROEN AN N<sub>2</sub>  
Z PHYSIK, VOL 204, 462-473, (1967)
- 2205 SHARP T E, DOWELL J T ISOTOPE EFFECTS IN DISSOCIATIVE ATTACHMENT OF ELECTRONS  
IN METHANE  
J CHEM PHYS, VOL 46, 1530, (1967)
- 2210 PEEK J H THEORY OF DISSOCIATION OF (H<sub>2</sub>)<sup>+</sup> BY FAST ELECTRONS  
PHYS REV, VOL 154, 52, (1967)
- 2211 NJOLNESS R C, RUPPEL H M BREMSSTRAHLUNG EMISSION FROM LOW-ENERGY ELECTRONS ON ATOMS  
PHYS REV, VOL 154, 98, (1967)
- 2215 DIBELER V H, MOHLER F L DISSOCIATION OF S F<sub>6</sub>, C F<sub>4</sub>, AND SI F<sub>4</sub> BY ELECTRON IMPACT  
J RES NATL BUR STD, VOL 40, 25-29, (1948)
- 2290 MEHR J WINKELVERTEILUNGEN ELASTISCH AN EDELGAS-ATOMSTRAHLEN  
GESTREUTER ELEKTROEN, SPINPOLARISATION EINES AN ARGON  
GESTREUTEN 40 EV- ELEKTROENSTRAHLS  
Z PHYSIK, VOL 198, 345, (1967)
- 2308 TURNER B R, RUTHERFORD J A, THE ABUNDANCE OF EXCITED IONS IN O<sup>+</sup> AND (O<sub>2</sub>)<sup>+</sup> ION BEAMS  
COMPTON D M J REPORT GA-7184, GENERAL ATOMIC, SAN DIEGO, (APRIL 1967)  
33 PAGES
- 2326 RAMSAUER G, KOLLATH R DIE WINKELVERTEILUNG BEI DER STREUUNG LANGSAMER ELEKTROEN  
AN GASMOLEKULEN. I. FORTSETZUNG  
ANN PHYSIK, VOL 10, 143, (1931)
- 2327 RAMSAUER G, KOLLATH R DIE WINKELVERTEILUNG BEI DER STREUUNG LANGSAMER ELEKTROEN  
AN GASMOLEKULEN  
ANN PHYSIK, VOL 9, 756, (1931)
- 2328 NY T, CHEN S THE DISPLACEMENT OF PRINCIPAL SERIES LINES OF RUBIDIUM BY  
THE ADDITION OF RARE GASES  
PHYS REV, VOL 51, 567, (1937)
- 2335 CZYZAK S J, KRUEGER T K ELECTRON COLLISIONS WITH IONS OF THE 3P TRIPLET CONFIGURATION  
PROC PHYS SOC LONDON, VOL 90, 623, (1967)
- 2349 SCHRAM B L, BOERBOOM A J H, IONIZATION CROSS-SECTION MEASUREMENTS FOR 0.6--20 KEV  
VAN DER WIEL M J, DE MEER F J, ELECTRONS IN ATOMIC AND MOLECULAR GASES  
KISTEMAKER J (IN) ADVANCES IN MASS SPECTROMETRY, W L HEAD, EDITOR,  
PETROLEUM INSTITUTE, PUBLISHER, LONDON, VOL 3, 273, (1966)  
PROCEEDINGS OF THE MASS SPECTROMETRY CONFERENCE (PARIS,  
SEPTEMBER 1964)
- 2366 SHIMON L L EXCITATION FUNCTIONS OF RUBIDIUM SPECTRAL LINES  
OPT SPECTRY USSR ENGLISH TRANSL, VOL 17, 12, (1964)
- 2422 DALY M R, POWELL R F ELECTRON-IMPACT EXCITATION OF THE 2S STATE AND AUTOIONIZATION  
BELOW THE N = 3 LEVEL OF (HE)<sup>+</sup> (EXPERIMENTAL)  
PHYS REV LETTERS, VOL 19, 1165-1167, (1967)
- 2427 ORMONDE S, WHITAKER W, CLOSE-COUPPLING CALCULATIONS OF ELECTRON-IMPACT EXCITATION  
LIPSKY L OF THE 2S STATE AND AUTOIONIZATION BELOW THE N = 3 LEVEL  
IN (HE)<sup>+</sup>  
PHYS REV LETTERS, VOL 19, 1161-1165, (1967)
- 2433 CROMPTON R W, ELFORD M T, THE MOMENTUM TRANSFER CROSS SECTION FOR ELECTRONS IN HELIUM  
JORY R L AUSTRALIAN J PHYS, VOL 20, 369-400, (1967)
- 2440 HALOWIN G C, FRIEDMAN S I TIME-OF-FLIGHT ELECTRON VELOCITY SPECTROMETER  
REV SCI INSTR, VOL 38, 519, (1967)
- 2464 HARA S THE SCATTERING OF SLOW ELECTRONS BY HYDROGEN MOLECULES  
J PHYS SOC JAPAN, VOL 22, 710, (1967)

- 2510 EHRHARDT H, LINDER F  
KOINZIDENZEXPERIMENTE ZUR UNTERSUCHUNG DER ENERGIEÜBERTRAGUNG  
BEIM STOSS NIEDERENERGETISCHER ELEKTRONEN MIT MOLEKULEN  
Z NATURFORSCH, VOL 22A, 444, (1967)
- 2541 MCFARLAND R H  
CROSSED-BEAM MEASUREMENT OF THE ELECTRON-IMPACT POLARIZATION  
OF HELIUM 4922 ÅNGSTRÖM OPTICAL RADIATION  
PHYS REV, VOL 156, 55, (1967)
- 2577 DOWELL J I, SHARP T E  
VIBRATIONAL STRUCTURE IN THE DISSOCIATIVE ATTACHMENT OF  
ELECTRONS IN HYDROGEN  
PHYS REV, VOL 167, 124-127, (1968)
- 2614 KIEFFER L J, VAN BRUNT R J  
ENERGETIC IONS FROM N<sub>2</sub> PRODUCED BY ELECTRON IMPACT  
J CHEM PHYS, VOL 46, 2728, (1967)
- 2616 SMITH K, HENRY R J W,  
BURKE P G  
CALCULATIONS ON THE SCATTERING OF ELECTRONS BY ATOMIC  
SYSTEMS WITH CONFIGURATIONS (2P)Q  
PHYS REV, VOL 157, 51, (1967)
- 2620 BOGDANOVA I P, YAKHONTOVA V E  
TEMPORAL CHARACTERISTICS OF THE PROCESSES POPULATING  
EXCITED MERCURY LEVELS  
OPT SPECTRY USSR ENGLISH TRANSL, VOL 22, 6, (1967)
- 2626 ANDERSON R J, LEE E T P,  
LIN C C  
ELECTRON EXCITATION FUNCTIONS OF MERCURY  
PHYS REV, VOL 157, 31, (1967)
- 2627 KHARE S P  
EXCITATION OF HYDROGEN MOLECULE BY ELECTRON IMPACT.  
III. SINGLET-TRIPLET EXCITATIONS  
PHYS REV, VOL 157, 107, (1967)
- 2640 VAINSHTEIN L A, VINOGRADOV A V  
IONIZATION OF AR ATOMS IN THE AR+ EXCITED STATE  
JETP LETTERS USSR ENGLISH TRANSL, VOL 5, 269, (1967)
- 2642 HEDDLE D W O, KEESING R G W  
HIGH-RESOLUTION MEASUREMENT OF ELECTRON EXCITATION TO  
THE 4S STATES OF HELIUM  
PROC PHYS SOC LONDON, VOL 91, 510, (1967)
- 2643 FRISH S E, KLYUCHAREV A N  
THE ROLE OF CASCADE TRANSITIONS IN THE EXCITATION OF  
THE 6S7S TRIPLET S 1 LEVEL OF MERCURY  
OPT SPECTRY USSR ENGLISH TRANSL, VOL 22, 92, (1967)
- 2646 BURROW P D  
INELASTIC COLLISIONS OF THE SECOND KIND BETWEEN ELECTRONS  
AND EXCITED MERCURY ATOMS  
PHYS REV, VOL 158, 65, (1967)
- 2647 KIEFFER L J, DUNN G H  
DISSOCIATIVE IONIZATION OF H<sub>2</sub> AND D<sub>2</sub>  
PHYS REV, VOL 158, 61, (1967)
- 2648 HEDDLE D W O, KEESING R G W  
THRESHOLD BEHAVIOUR OF ELECTRON EXCITATION AND  
POLARIZATION FUNCTIONS IN HELIUM  
PROC ROY SOC LONDON SER A, VOL 299, 212, (1967)
- 2650 EHRHARDT H, HILLMANN K  
DIE WINKELABHÄNGIGKEIT DER UNELASTISCHEN RESONANZSTREUUNG  
NIEDERENERGETISCHER ELEKTRONEN AN HELIUM  
Z PHYSIK, VOL 203, 1, (1967)
- 2655 INOKUTI M  
EXCITATION OF THE HYDROGEN ATOM BY FAST ELECTRONS IN THE  
OSHKUR APPROXIMATION  
J PHYS SOC JAPAN, VOL 22, 971, (1967)
- 2658 BRENN B, VON PUTTKAMER E  
KOINZIDENZMESSUNG VON PHOTOIONEN UND PHOTOELEKTRONEN BEI  
METHAN  
Z NATURFORSCH, VOL 22A, 8, (1967)
- 2659 SKERBELE A, DILLON M A,  
LASSETTRE E N  
SINGLET-TRIPLET TRANSITIONS IN THE ELECTRON IMPACT  
SPECTRUM OF N<sub>2</sub>  
J CHEM PHYS, VOL 46, 4161, (1967)
- 2660 KUPRIYANOV S E  
MASS-SPECTROMETRIC OBSERVATION OF LONG-LIVED  
AUTO-IONIZATION STATES OF THE IONS CA<sup>+</sup> AND SR<sup>+</sup>  
JETP LETTERS USSR ENGLISH TRANSL, VOL 4, 233, (1967)
- 2665 MORRISON D J T, RUDGE M R W  
EXCITATION OF TRIPLET STATES IN HELIUM BY ELECTRON IMPACT  
PROC PHYS SOC LONDON, VOL 91, 565, (1967)
- 2667 WEAVER L D, HUGHES P H  
EXCITATION OF THE HE II LAMBDA 4686-ÅNGSTRÖM LINE BY  
ELECTRON IMPACT  
J CHEM PHYS, VOL 47, 346, (1967)
- 2691 ZARE R N  
DISSOCIATION OF (H<sub>2</sub>)<sup>+</sup> BY ELECTRON IMPACT - CALCULATED  
ANGULAR DISTRIBUTION  
J CHEM PHYS, VOL 47, 284, (1967)

- 2694 SKERBELE A, DILLON M A, LASSETTRE E N SINGLET-TRIPLET TRANSITIONS IN CARBON MONOXIDE  
J CHEM PHYS, VOL 46, 4162, (1967)
- 2695 PERLMAN H S THE RELATIVISTIC THEORY OF K IONIZATION BY ELECTRONS  
PROC PHYS SOC LONDON, VOL 76, 623, (1960)
- 2696 LASSETTRE E N, SKERBELE A, DILLON M A ELECTRON-IMPACT SPECTRUM OF ETHANE  
J CHEM PHYS, VOL 46, 4536, (1967)
- 2698 KHAIKIN A S INVESTIGATION OF ELECTRON COLLISIONS WITH EXCITED NEON ATOMS  
JETP LETTERS USSR ENGLISH TRANSL, VOL 3, 68, (1966)
- 2706 VOUGHT R H MOLECULAR DISSOCIATION BY ELECTRON BOMBARDMENT - A STUDY  
OF SI CL<sub>4</sub>  
PHYS REV, VOL 71, 93, (1947)
- 2713 MCFARLAND R H ELECTRON-IMPACT IONIZATION MEASUREMENTS OF SURFACE-IONIZABLE  
ATOMS  
PHYS REV, VOL 159, 20, (1967)
- 2714 MALINOWSKA-ADAMSKA C LOW ENERGY SCATTERING OF ELECTRONS BY THOMAS-FERMI ATOMS  
ACTA PHYS POLON, VOL 31, 721-725, (1967)
- 2715 KORCHEVOI YU P, PRZHONSKII A M EFFECTIVE ELECTRON IMPACT EXCITATION AND IONIZATION CROSS  
SECTIONS FOR CESIUM, RUBIDIUM, AND POTASSIUM ATOMS IN THE  
PRE-THRESHOLD REGION  
SOVIET PHYS JETP ENGLISH TRANSL, VOL 24, 1889-1892, (1967)
- 2721 WAREING J B, DOLDER K T A MEASUREMENT OF THE CROSS SECTION FOR IONIZATION OF LI+  
TO LI(2+) BY ELECTRON IMPACT  
PROC PHYS SOC LONDON, VOL 91, 887-893, (1967)
- 2725 FELTSAN P V, ZAPESCHNYI I P, POVCH M M EXCITATION OF INERT GASES IN ELECTRON-ATOMIC COLLISIONS.  
II. NEON  
UKR FIZ ZH, VOL 11, 1222-1230, (1966)
- 2726 ALEKSACHIN I S, ZAPESCHNYI I P EXCITATION CROSS SECTIONS OF LOWER LEVELS OF LITHIUM  
OPT SPECTRY USSR ENGLISH TRANSL, VOL 22, 458-459, (1967)
- 2729 PAVLOV S I, RAKHOVSKII V I, FEDOROVA G N MEASUREMENT OF CROSS SECTIONS FOR IONIZATION BY ELECTRON  
IMPACT AT LOW VAPOR PRESSURES  
SOVIET PHYS JETP ENGLISH TRANSL, VOL 25, 12-16, (1967)
- 2730 NEUERT M NEGATIVE IONEN RFI DISSOZIATION VON SE H<sub>2</sub> UND S H<sub>2</sub> DURCH  
ELEKTROSTOSS UND DIE ELEKTROENAFFINITAT DES SCHWEFELS  
UND DES SELENS  
Z NATURFORSCH, VOL 8A, 459-462, (1953)
- 2731 GUTBIER M MASSENSPEKTROMETRISCHE UNTERSUCHUNGEN VON C H<sub>2</sub>BR<sub>2</sub>, C H<sub>2</sub>CL<sub>2</sub>,  
C H<sub>3</sub>BR UND C H<sub>3</sub>CL  
Z NATURFORSCH, VOL 9A, 348-350, (1954)
- 2733 BEIGMAN I L, VAINSHTEIN L A EFFECTIVE CROSS SECTIONS FOR THE EXCHANGE EXCITATION OF  
ATOMS AND IONS BY ELECTRON IMPACT  
SOVIET PHYS JETP ENGLISH TRANSL, VOL 25, 119-123, (1967)
- 2736 CROTHERS D ON THE VAINSHTEIN APPROXIMATION FOR ELECTRON-ATOM COLLISIONS  
PROC PHYS SOC LONDON, VOL 91, 855-861, (1967)
- 2737 NIEMAU A ANREGUNG UND DISSOZIATION VON MOLEKULEN BEIM  
ELEKTROSTOSS. MESSUNG DER BILDUNGSWAHRSCHENLICHKEIT  
FUR NEUTRALE FRAGMENTE ALS FUNKTION DER ELEKTROENERGIE  
Z NATURFORSCH, VOL 22A, 698-700, (1967)
- 2744 GAUDIN A, MASEMANN P DETERMINATIONS ABSOLUES DES SECTIONS EFFICACES TOTALES ET  
PARTIELLES D'IONISATION DE L'HELIUM, DU NEON, DE L'ARGON  
ET DE L'ACETYLENE, POUR DES ELECTRONS DE 100 A 2000 EV  
J CHIM PHYS, VOL 64, 1289-1291, (1967)
- 2749 JHA R ELECTRON SCATTERING BY ATOMIC HYDROGEN IN OCHSUD APPROXIMATION  
INDIAN J PHYS, VOL 41, 373-377, (1967)
- 2750 BANERJEE S N EXCITATION OF 1 SINGLET S STATE TO 2 SINGLET S STATE OF  
HELIUM ATOM BY ELECTRON IMPACT IN OCHSUD APPROXIMATION  
INDIAN J PHYS, VOL 41, 266-269, (1967)
- 2751 BANERJEE S N, SIL M C EFFECT OF HIGHER ORDER PARTIAL WAVE PHASE SHIFTS IN ELASTIC  
ELECTRON SCATTERING BY HELIUM ATOM  
INDIAN J PHYS, VOL 41, 350-361, (1967)
- 2753 WERNHARDT H, MONTERO-GARCIA A BESTIMMUNG VON WIRKUNGSQUERSCHNITTEN AUS MESSUNGEN AN  
POLYMERISCHEN KATHODENROHREN  
Z PHYSIK, VOL 285, 313-327, (1967)

- 2754 MICHELS M H, HARRIS F F EXPANSION APPROACH TO LOW-ENERGY ELECTRON-HYDROGEN-ATOM SCATTERING  
PHYS REV LETTERS, VOL 19, 885-886, (1967)
- 2756 BRATSEV V F, OCHKUR V I IONIZATION OF HYDROGEN ATOM BY ELECTRON IMPACT IN THE THREE-BODY APPROXIMATION OF CLASSICAL MECHANICS  
SOVIET PHYS JETP ENGLISH TRANSL, VOL 25, 631-633, (1967)
- 2757 SHPENIK O B, ZAPESCHNYI I P EXCITATION CROSS SECTIONS NEAR THE THRESHOLD FOR ELECTRON-ATOM COLLISIONS  
OPT SPECTRY USSR ENGLISH TRANSL, VOL 23, 8-10, (1967)
- 2758 KELLY M P USE OF THE OPTICAL POTENTIAL FOR ELASTIC SCATTERING OF ELECTRONS BY ATOMS  
PHYS REV, VOL 160, 44-52, (1967)
- 2759 FELDMAN P, NOVICK R AUTO-IONIZING STATES IN THE ALKALI ATOMS WITH MICROSECOND LIFETIMES  
PHYS REV, VOL 160, 143-158, (1967)
- 2760 ZIESEL J P IONISATION MULTIPLE DU ZINC PAR IMPACT ELECTRONIQUE DE 250 A 2000 EV  
J CHIM PHYS, VOL 64, 706-707, (1967)
- 2761 ZIESEL J P, ABOUAF R IONISATION MULTIPLE DANS LE BARYUM PAR IMPACT ELECTRONIQUE JUSQU'A 2000 EV  
J CHIM PHYS, VOL 64, 702-705, (1967)
- 2762 ZIESEL J P IONISATION MULTIPLE DU KRYPTON, DU RUBIDIUM ET DU STRONTIUM PAR IMPACT ELECTRONIQUE JUSQU'A 500 EV  
J CHIM PHYS, VOL 64, 695-701, (1967)
- 2763 SCHULZ G J, ASUNDI R K ISOTOPE EFFECT IN THE DISSOCIATIVE ATTACHMENT IN H<sub>2</sub> AT LOW ENERGY  
PHYS REV, VOL 158, 25-29, (1967)
- 2769 LIN C C CALCULATION OF THE CROSS SECTION OF ELECTRON-ATOM INELASTIC COLLISIONS  
AFCRL-65-36, AIR FORCE CAMBRIDGE RESEARCH LABORATORIES, BEDFORD, MASSACHUSETTS, AD-613693, 1964, 23 PAGES
- 2772 VAN ZYL B, DUNN G H DISSOCIATION OF (N<sub>2</sub>)<sup>+</sup> AND (O<sub>2</sub>)<sup>+</sup> BY ELECTRON IMPACT  
PHYS REV, VOL 163, 43-44, (1967)
- 2773 CARTWRIGHT D C, KUPPERMANN A ELECTRON-IMPACT EXCITATION CROSS SECTION FOR THE TWO LOWEST TRIPLET STATES OF MOLECULAR HYDROGEN  
PHYS REV, VOL 163, 86-102, (1967)
- 2774 FELS M F, HITTLEMAN M H POSITRONIUM FORMATION IN POSITRON-HYDROGEN SCATTERING  
PHYS REV, VOL 163, 129-134, (1967)
- 2777 WILKINS R L, TAYLOR M S ELASTIC SCATTERING OF LOW-ENERGY ELECTRONS FROM MOLECULAR HYDROGEN  
J CHEM PHYS, VOL 47, 3532-3539, (1967)
- 2782 SROKA W EXCITATION OF EXTREME ULTRA-VIOLET RADIATION (GAS-IONIZING RADIATION) IN OXYGEN BY ELECTRON COLLISIONS  
PHYS LETTERS, VOL 25A, 770-771, (1967)
- 2783 TAKAYANAGI K, INOKUTI M ON THE SCATTERING OF SLOW POSITRONS BY MOLECULES  
J PHYS SOC JAPAN, VOL 23, 1412-1414, (1967)
- 2784 MCGOWAN J M, FIMENAN M A, CLARKE E H, HANSON M P IONIZATION OF H(1S) NEAR THRESHOLD  
PREPRINT  
GA-7387, GENERAL ATOMIC, SAN DIEGO, PART 1, 41 PAGES
- 2785 HOLLAND R F CROSS SECTIONS FOR ELECTRON EXCITATION OF THE 3914-ANGSTROM (8,8) BAND OF THE (N<sub>2</sub>)<sup>+</sup> FIRST NEGATIVE SYSTEM  
LA-3783, LOS ALAMOS SCIENTIFIC LABORATORY, UNIVERSITY OF CALIFORNIA, LOS ALAMOS, NEW MEXICO, 1967, 13 PAGES
- 2786 HONNIN C F, PROK E H COMPARISON OF GRYZINSKI AND BORN CROSS SECTIONS FOR THE METASTABLE 2S STATE OF ATOMIC HYDROGEN  
NASA TN D-3838, LEWIS RESEARCH CENTER, CLEVELAND, OHIO, 1967, 32 PAGES
- 2788 DANCE D F, HARRISON M F A, RUMDEL R D A MEASUREMENT OF THE CROSS SECTION FOR DETACHMENT OF ELECTRONS FROM H<sup>-</sup> BY ELECTRON IMPACT  
PROC ROY SOC LONDON SER A, VOL 298, 529-537, (1967)
- 2790 DANCE D F, HARRISON M F A, RUMDEL R D, SMITH A C M A MEASUREMENT OF THE CROSS SECTION FOR PROTON PRODUCTION IN COLLISIONS BETWEEN ELECTRONS AND (H<sub>2</sub>)<sup>+</sup> IONS  
PROC PHYS SOC LONDON, VOL 92, 577-588, (1967)

- 2791 RYRKE P G, OPHONDE S, WHITAKER M  
LOW-ENERGY ELECTRON SCATTERING BY ATOMIC HYDROGEN - I. THE CLOSE-COUPPLING APPROXIMATION  
PROC PHYS SOC LONDON, VOL 92, 319-335, (1967)
- 2792 TAYLOR A J, RYRKE P G  
LOW-ENERGY ELECTRON SCATTERING BY ATOMIC HYDROGEN - II. THE CORRELATION METHOD  
PROC PHYS SOC LONDON, VOL 92, 336-344, (1967)
- 2795 FELTSAN P V  
EXCITATION OF INERT GASES AT ELECTRON-ATOM COLLISIONS. IV. KRYPTON  
UKR FIZ ZH, VOL 12, 1423-1431, (1967)
- 2797 MEHLHORN H  
AUGER- UND COSTER-KRONIG-ÜBERGÄNGE DER M-SCHALE VON KRYPTON  
Z PHYSIK, VOL 187, 21-40, (1965)
- 2798 TAKAYANAGI K  
EXCITATION OF MOLECULAR VIBRATION BY SLOW ELECTRONS  
J PHYS SOC JAPAN, VOL 20, 2297, (1965)
- 2799 VAINSHTEIN L A, VINOGRADOV A V  
THE IONIZATION OF AR ATOMS TO AN EXCITED STATE OF AR+  
OPT SPECTRY USSR ENGLISH TRANSL, VOL 23, 101-102, (1967)
- 2822 RUBIN K  
MEASUREMENT OF THE EXCHANGE CROSS SECTION FOR THE SCATTERING OF ELECTRONS BY POTASSIUM ATOMS AND THE DEVELOPMENT OF AN ATOM RECOIL METHOD FOR PERFORMING SCATTERING EXPERIMENTS  
THESIS, NEW YORK UNIVERSITY, 1959, 147 PAGES, UNIVERSITY MICROFILMS INC, ANN ARBOR, MICHIGAN, NO. 66-9758
- 2823 YEATES C H  
ANGULAR DISTRIBUTIONS FOR ELASTIC AND INELASTIC ELECTRON-HG SCATTERED AT LOW ENERGIES  
THESIS, BRIGHAM YOUNG UNIVERSITY, PROVO, UTAH, 1967, 88 PAGES, UNIVERSITY MICROFILMS INC, ANN ARBOR, MICHIGAN, NO. 67-2586
- 2824 BREIG E L  
A STUDY OF VIBRATIONAL EXCITATION OF MOLECULES AND TRANSITIONS BETWEEN THE SPIN-MULTIPLETS OF ATOMIC OXYGEN INDUCED BY ELECTRON COLLISION  
THESIS, UNIVERSITY OF OKLAHOMA, 1966, 204 PAGES, UNIVERSITY MICROFILMS INC, ANN ARBOR, MICHIGAN, NO. 66-118786
- 2825 CRAWFORD C K  
ELECTRON-IONIZATION CROSS SECTIONS  
SEMIANNUAL PROGRESS REPORT NO. 7, RESEARCH AND TECHNOLOGY DIVISION, WRIGHT-PATTERSON AFB, DAYTON, OHIO, 1966, 26 PAGES, AD 813 425
- 2826 SIMPSON D H  
EFFECT OF INDUCED DIPOLE INTERACTION ON THE CROSS SECTION FOR ROTATIONAL EXCITATION BY ELECTRONS  
R635D43, G E SPACE SCIENCES LABORATORY, AD 487 834, MAY 1967, 21 PAGES
- 2827 LASSETTRE E M, GLASER F M  
ELECTRON IMPACT STUDY OF NITROGEN  
SCIENTIFIC REPORT NO. 6, OHIO STATE UNIVERSITY RESEARCH FOUNDATION, COLUMBUS, OHIO, 1962, AD 296 818, 26 PAGES
- 2830 ZAPESOGHNYI I P  
ABSOLUTE CROSS SECTIONS FOR THE EXCITATION OF THE LEVELS OF ALKALI METAL ATOMS BY LOW-ENERGY ELECTRONS  
HIGH TEMP USSR ENGLISH TRANSL, VOL 9, 6-11, (1967)
- 2832 PETRINI D  
SECTIONS DE CHOC DU FE XIV  
COMPT REND, VOL 264, 411-412, (1967)
- 2833 FELTSAN P V, ZAPESOGHNYI I P  
EXCITATION OF INERT GASES DURING ELECTRON-ATOM COLLISIONS. III. ARGON  
UKR FIZ ZH, VOL 12, 633-640, (1967)
- 2836 CATLOW G M, McDOWELL M R C  
A CLASSICAL MODEL FOR ELECTRON AND PROTON IMPACT IONIZATION  
PROC PHYS SOC LONDON, VOL 92, 875-879, (1967)
- 2837 INOKUTI M, KIM Y K, PLATZMAN R L  
TOTAL CROSS SECTIONS FOR INELASTIC SCATTERING OF CHARGED PARTICLES BY ATOMS AND MOLECULES. I. A SUM RULE FOR THE BEING CROSS SECTIONS AND ITS APPLICATION TO THE HELIUM ATOM  
PHYS REV, VOL 164, 55-61, (1967)
- 2838 JOSE J D, ST JOHN R M  
ABSOLUTE MEASUREMENTS OF THE 2 SINGLET P AND 2 TRIPLET P ELECTRON EXCITATION CROSS SECTIONS OF HELIUM ATOMS  
PHYS REV, VOL 164, 117-121, (1967)
- 2841 WILKINS L, SIMPSON J A, HILCZAREK S B  
TESTS OF BORN APPROXIMATIONS - DIFFERENTIAL AND TOTAL 2 TRIPLET S, 2 SINGLET P, AND 2 SINGLET S CROSS SECTIONS FOR EXCITATION OF HE BY 100- TO 400-EV ELECTRONS  
PHYS REV, VOL 165, 7-15, (1968)
- 2870 PERESSÉ J, TUFFIN F  
PROCESSUS D'IONISATION DE L'OXYGÈNE MOLECULAIRE - COMPARAISON AVEC LES RESULTATS DE PHOTOIONISATION  
COMPT REND, VOL 265, 1314-1317, (1967)

- 2888 AGNEW L, SUMMERS C  
QUANTITATIVE SPECTROSCOPY OF CESIUM PLASMAS  
(IN) PROCEEDINGS OF THE SEVENTH INTERNATIONAL CONFERENCE ON  
PHENOMENA IN IONIZED GASES (BELGRADE, 22-27 AUGUST 1965)  
B PEROVIC AND D TOSIC, EDITORS, GRADEVINSKA KNJIGA PUBLISHING  
HOUSE, BELGRADE, VOL 2, 574, (1966)
- 2893 GARRETT W R  
ADIABATIC EXCHANGE APPROXIMATION IN ELECTRON SCATTERING  
FROM MULTI-ELECTRON ATOMS  
UARI REPORT NO. 19, HUNTSVILLE, ALABAMA, 1965, 39 PAGES
- 2899 MELTON C E, RUDDOLPH P S  
RADIOLYSIS OF METHANE IN A WIDE-RANGE RADIOLYSIS SOURCE  
OF A MASS SPECTROMETER. I. INDIVIDUAL AND TOTAL CROSS SECTIONS  
FOR THE PRODUCTION OF POSITIVE IONS, NEGATIVE IONS, AND  
FREE RADICALS BY ELECTRONS  
J CHEM PHYS, VOL 47, 1771-1774, (1967)
- 2900 KOHL F J, UV O M,  
CARLSON K D  
CROSS SECTIONS FOR ELECTRON-IMPACT FRAGMENTATION AND  
DISSOCIATION ENERGIES OF THE DIMER AND TETRAMER OF BISMUTH  
J CHEM PHYS, VOL 47, 2867-2876, (1967)
- 2901 KOLMENSTVEDT H  
SIMPLE THEORY FOR K-IONIZATION BY RELATIVISTIC ELECTRONS  
J APPL PHYS, VOL 38, 4785-4788, (1967)
- 2902 KLEINPOPPEN H, KRAISS E  
CROSS SECTION AND POLARIZATION OF THE H-ALPHA LINE BY  
ELECTRON IMPACT EXCITATION  
PHYS REV LETTERS, VOL 20, 361-363, (1968)
- 2903 JOSE J O, ST JOHN R H  
EXCITATION OF THE 4F STATES OF HELIUM  
J OPT SOC AM, VOL 57, 1449-1451, (1967)
- 2904 TISONE G C, BRANSCOMB L M  
DETACHMENT OF ELECTRONS FROM H- AND O- NEGATIVE IONS BY  
ELECTRON IMPACT  
PHYS REV, VOL 170, 189-193, (1968)
- 2905 GARCIA J D  
ATOMIC-SHELL STRUCTURE IN INELASTIC COLLISIONS  
J CHEM PHYS, VOL 47, 3679-3688, (1967)
- 2906 POLUSHKIN I M, DUBKO D V  
EFFECTIVE CROSS SECTION OF PLASMA SCATTERING OF ELECTRONS  
1. HELIUM AND IN ARGON WITH CESIUM VAPOUR ADMIXTURE  
UKR FIZ ZH, VOL 11, 950-956, (1966)
- 2907 ZAPESCHNYI I P, PALINCHAK V V  
STUDY OF FUNCTIONS OF METAL ATOM EXCITATION IN CROSSING BEAMS  
UKR FIZ ZH, VOL 11, 775-788, (1966)
- 2909 ZAPESCHNYI I P, FELTSAN P V  
EFFECTIVE CROSS-SECTION OF EXCITATION OF NE 2P LEVELS  
ZH PRIKL SPEKTROSKOPIYA, VOL 4, 111-112, (1967)
- 2910 EISINGHAUS H  
NEGATIVE IONEN AUS ALKALIMHALOGENIDEN UND ELEKTROENAFFINITÄTEN  
DER ALKALIMETALLE UND ALKALIMHALOGENIDE  
Z NATURFORSCH, VOL 19A, 727-732, (1964)
- 2911 GAVALLAS L A  
INVESTIGATION OF EXCITATION CROSS-SECTIONS OF SOME INERT  
GASES NEAR THE THRESHOLD  
IZV VYSSHEKH UCHENYKH ZAVEDENII FIZ, VOL 58, 142-144, (1967)
- 2912 CHAMBERLAIN G E, SIMPSON J A,  
MIELCZAK S R, KUVATT C E  
EFFECT OF DOUBLE SCATTERING ON CROSS-SECTION MEASUREMENTS AT  
LARGE MOMENTUM TRANSFER  
J CHEM PHYS, VOL 47, 4266-4267, (1967)
- 2913 MILLER K J, KRAUSS H  
BORN INELASTIC DIFFERENTIAL CROSS SECTIONS IN H2  
J CHEM PHYS, VOL 47, 3794-3797, (1967)
- 2914 ROZSNYAI D F  
THEORY OF ELECTRON COLLISIONS WITH MONONUCLEAR DIATOMIC  
MOLECULES  
J CHEM PHYS, VOL 47, 4182-4112, (1967)
- 2915 BOEDING J P, WILLIAMS A J  
LOW-ENERGY, LARGE-ANGLE ELECTRON-IMPACT SPECTRA - HELIUM,  
NITROGEN, ETHYLENE, AND BENZENE  
J CHEM PHYS, VOL 47, 4188-4194, (1967)
- 2916 LUCAS C O  
AN EXPERIMENTAL INVESTIGATION OF ELECTRON IMPACT RADIATION  
IN HELIUM  
THESIS, UNIVERSITY COLLEGE LONDON, 1963, 106 PAGES
- 2917 CRAWFORD C K  
ELECTRON IMPACT IONIZATION CROSS SECTIONS  
AFML-79-67-776, AIR FORCE MATERIALS LABORATORY,  
WRIGHT-PATTERSON AFB, OHIO, 1967, 140 PAGES
- 2918 CRAWFORD C K, HANE K I  
ELECTRON-IMPACT IONIZATION CROSS SECTIONS FOR SILVER  
J CHEM PHYS, VOL 47, 4667-4669, (1967)
- 2923 FOWLER B G, LIN C C,  
ST JOHN O B  
RESEARCH ON THE OPTICAL PROPERTIES OF MATTER  
AFML-79-66-132, AIR FORCE MATERIALS LABORATORY, 1967, 306 PAGES

- 2929 MOUSTAFA MOUSSA H R  
EXCITATION OF HELIUM BY FAST ELECTRONS AND POLARIZATION OF THE RESULTING RADIATION  
THESIS, UNIVERSITY OF LEIDEN, 1967, 116 PAGES
- 2937 DAMBURG R, KARULE E M  
POSITRON COLLISIONS WITH HYDROGEN ATOMS  
ATOMIC COLLISIONS, PART 2, RIGA USSR, ENGLISH TRANSLATION, M I T PRESS, CAMBRIDGE, MASS, PAGE 48, 1966
- 2938 RACON F M, HOOPER J W  
THE EXCITATION OF BARIUM IONS BY ELECTRON IMPACT  
REPORT NO. ORO-3027-12, USAEC, OAK RIDGE TENN, 1968, 108 PAGES
- 2939 DOWELL J T, SHARP T E  
ELECTRON IMPACT EXCITATION OF THE C TRIPLET  $P^1$  U STATES OF H<sub>2</sub> AND D<sub>2</sub> BY A TRAPPED-ELECTRON METHOD  
J CHEM PHYS, VOL 47, 5068-5073, (1967)
- 2944 LIN S S, STAFFORD F E  
ELECTRON-IMPACT IONIZATION CROSS SECTIONS. IV. GROUP IV B ATOMS  
J CHEM PHYS, VOL 47, 4664-4666, (1967)
- 2945 DE MEER F J, MOUSTAFA MOUSSA H R, INOKUTI M  
PRODUCTION OF LYMAN-ALPHA RADIATION IN COLLISIONS OF ELECTRONS ON MOLECULAR HYDROGEN (0.05 - 3 KEV)  
CHEM PHYS LETTERS, VOL 1, 484-486, (1967)
- 2946 BEIGHAN I L, VAINSHTEIN L A  
CROSS SECTIONS FOR IONIZATION OF IONS BY ELECTRON IMPACT  
SOVIET ASTRON AJ ENGLISH TRANSL, VOL 11, 712-715, (1968)
- 2947 COLLINS R E, GOLOSTEIN M, PEDERSON B, RUBIN K  
ELASTIC DIFFERENTIAL SPIN-EXCHANGE CROSS SECTIONS FOR SCATTERING OF SLOW ELECTRONS BY POTASSIUM  
PHYS REV LETTERS, VOL 19, 1366-1368, (1967)
- 2954 MCGONAN J W, FINEMAN M A, CLARKE E M, HANSON M P  
DIRECT AND AUTO-IONIZATION OF H<sub>2</sub> NEAR THRESHOLD  
PHYS REV, VOL 167, 52-60, (1968)
- 2955 MCGONAN J W, CLARKE E M  
IONIZATION OF H(1S) NEAR THRESHOLD  
PHYS REV, VOL 167, 43-51, (1968)
- 2956 POLUSHKIN I M, DUDKO D V  
EFFECTIVE CROSS-SECTION OF ELECTRON SCATTERING IN HE AND Ar PLASMA WITH ADMIXTURE OF POTASSIUM VAPOUR AND IN PURE POTASSIUM  
UKR FIZ ZH, VOL 11, 1269-1271, (1966)
- 2957 CAVALLAS L A, KAGAN VU M  
MULTIPLE SCATTERING OF SLOW ELECTRONS IN GASES. II.  
IZV VYSSHIKH UCHENYKH ZAVEDENII FIZ, VOL 50, 20-23, (1967)
- 2959 CALLANAY J, LABANN R M, PU R T, BUXLER M M  
EXTENDED POLARIZATION POTENTIAL - APPLICATIONS TO ATOMIC SCATTERING  
PHYS REV, VOL 168, 12-21, (1968)
- 2962 PICHANICK F W J, SIMPSON J A  
RESONANCES IN THE TOTAL CROSS SECTIONS FOR METASTABLE EXCITATION OF NOBLE GASES BY ELECTRON IMPACT  
PHYS REV, VOL 168, 64-70, (1968)
- 2964 SRIVASTAVA B N, MIRZA I M  
ABSOLUTE CROSS SECTIONS FOR SIMULTANEOUS IONIZATION AND EXCITATION OF N<sub>2</sub> BY ELECTRON IMPACT  
PHYS REV, VOL 168, 86-88, (1968)
- 2965 PECUL M  
IONIZATION OF THE HELIUM ATOM BY ELECTRON IMPACT  
ACTA PHYS POLON, VOL 32, 689-689, (1967)
- 2966 ONYUK VU D  
THE EFFECT OF VIBRATIONAL EXCITATION ON THE DISSOCIATION OF THE MOLECULAR HYDROGEN ION UNDER ELECTRON AND PROTON IMPACT  
OPT SPECTROV USSR ENGLISH TRANSL, VOL 23, 197-201, (1967)
- 2967 PENNIN M P, BEHRE T P  
EFFECTIVE CROSS SECTIONS FOR EXCITATION OF THE S TRIPLET P 0,1,2 LEVELS OF I BY ELECTRON IMPACT  
OPT SPECTROV USSR ENGLISH TRANSL, VOL 23, 292-293, (1967)
- 2968 BANERJEE S M, JHA G, SIKH R C  
ELASTIC RESONANCE IN ELECTRON-HYDROGEN SCATTERING  
INDIAN J PHYS, VOL 41, 482-489, (1967)
- 2969 FINNEY-FAVARD F, CHIAPI J, MULLER F, FIESEL J P  
ENERGY DEPENDENCE FOR SINGLE AND DOUBLE IONIZATION BY ELECTRON IMPACT BETWEEN 250 AND 1000 EV  
J CHEM PHYS, VOL 48, 470-482, (1968)
- 2971 FRISH S V, KLUCHENKO A M  
THE ROLE OF C-CASCADE TRANSITIONS IN THE EXCITATION OF SODIUM LINES  
OPT SPECTROV USSR ENGLISH TRANSL, VOL 23, 271-272, (1967)

- 2974 KODZUKAWA S M  
EXCITATION CROSS SECTIONS FOR SOME OF THE STATES OF  
2P QUARTET - 3P CONFIGURATION OF NEON AND 4P QUARTET - 5P  
CONFIGURATION OF KRYPTON  
REPORT 1843-37, OHIO STATE UNIVERSITY, NASA M67-30035,  
1967, 9 PAGES
- 2975 KRAUS K  
BESTIMMUNG KRITISCHER ELEKTROENENERGIEN FÜR DIE BILDUNG  
NEGATIVER IONEN BEI ELEKTROENSTOSS MITTELS EINER FPD-METHODE  
Z NATURFORSCH, VOL 164, 1378-1385, (1961)
- 2976 MOLLAND R F  
EXCITATION OF NITROGEN BY ELECTRONS - THE LYMAN-BIRGE-HOPFIELD  
SYSTEM OF N<sub>2</sub>  
PREPRINT  
LA-DC-9468, LOS ALAMOS SCIENTIFIC LABORATORY, U OF CALIF,  
LOS ALAMOS, NEW MEXICO, 1968, 32 PAGES PLUS FIGURES
- 2977 PEART B, DOLDER K T  
MEASUREMENTS OF CROSS SECTIONS FOR THE IONIZATION OF (N<sub>2</sub>)<sup>+</sup>  
AND K<sup>+</sup> TO (K<sub>2</sub>)<sup>+</sup> BY ELECTRON IMPACT  
J PHYS B PROC PHYS SOC, VOL 1, 248-244, (1968)
- 3000 FELYSAN P V, ZAPESCHNYI I P  
EXCITATION OF INERT GASES AT ELECTRON-ATOM COLLISIONS.  
V. XENON  
UKR FIZ ZH, VOL 13, 285-218, (1968)
- 3001 LEVENTHAL N, ROBISCOE P T,  
LEA K R  
VELOCITY DISTRIBUTION OF METASTABLE H ATOMS PRODUCED BY  
DISSOCIATIVE EXCITATION OF H<sub>2</sub>  
PHYS REV, VOL 158, 49-56, (1967)
- 3002 KENNEDY D J, KINGSTON A E  
THE EXCITATION OF THE GROUND STATE OF HELIUM TO THE 2 SINGLET  
P STATE BY FAST ELECTRONS  
J PHYS P PROC PHYS SOC 2, VOL 1, 195-203, (1968)
- 3003 BELY O  
THE STRUCTURE OF THE IONIZATION CURVES OF THE SODIUM-LIKE IONS  
J PHYS B PROC PHYS SOC 2, VOL 1, 23-28, (1968)
- 3006 CHRISTOPHOROU L G, STOCKDALE J A  
DISSOCIATIVE ELECTRON ATTACHMENT TO MOLECULES  
J CHEM PHYS, VOL 48, 1956-1968, (1968)
- 3007 CHRISTOPHOROU L G, COMPTON R N,  
DICKSON H W  
DISSOCIATIVE ELECTRON ATTACHMENT TO HYDROGEN HALIDES AND  
THEIR DEUTERATED ANALOGS  
J CHEM PHYS, VOL 48, 1949-1955, (1968)
- 3013 BELY O, BELY F  
THE EXCITATION OF Fe XVII BY ELECTRON IMPACTS  
SOLAR PHYS, VOL 2, 285-289, (1967)
- 3018 BELL K L, KENNEDY D J,  
KINGSTON A E  
EXCITATION OF HELIUM BY FAST ELECTRONS  
J PHYS B PROC PHYS SOC 2, VOL 1, 204-217, (1968)
- 3019 BELL K L, KENNEDY D J,  
KINGSTON A E  
THE EFFECT OF ELECTRON EXCHANGE IN THE EXCITATION OF ATOMIC  
HELIUM BY ELECTRON IMPACT  
J PHYS B PROC PHYS SOC 2, VOL 1, 322-324, (1968)
- 3023 FIQUET-FAYARD F, CHIARI J  
IONISATION DE L'HYDROGENE PAR IMPACT ELECTRONIQUE ENTRE  
250 ET 2200 EV  
PHYS LETTERS, VOL 26A, 512-513, (1968)
- 3024 NISHIMURA H  
EXCITATION OF (N<sub>2</sub>)<sup>+</sup>, (O<sub>2</sub>)<sup>+</sup> AND (C O<sub>2</sub>)<sup>+</sup> BAND BY ELECTRON  
IMPACT  
J PHYS SOC JAPAN, VOL 24, 138-143, (1968)
- 3025 ARDILL R M B, DAVISON W D  
EXCHANGE EFFECTS IN THE ROTATIONAL EXCITATION OF MOLECULAR  
HYDROGEN BY SLOW ELECTRONS  
PROC ROY SOC LONDON SER A, VOL 384, 465-477, (1968)
- 3027 LONG R L, COX D M,  
SMITH S J  
ELECTRON IMPACT EXCITATION OF HYDROGEN LYMAN-ALPHA RADIATION  
J RES NATL BUR STD, VOL 72A, 521, (1968)
- 3050 EMEL'YANOV A N, KHODEEV YU S,  
GOROKHOV L N  
ELECTRON IMPACT IONIZATION OF CS<sup>+</sup> IONS  
(IN ABSTRACTS OF) THE FIFTH INTERNATIONAL CONFERENCE ON THE  
PHYSICS OF ELECTRONIC AND ATOMIC COLLISIONS (LENINGRAD,  
USSR, 17-23 JULY 1967) PUBLISHING HOUSE NAUKA, LENINGRAD,  
PAGE 46, 1967
- 3051 SRINIVASAN V, REES J A,  
CRAGGS J D  
MEASUREMENTS OF THE TOTAL IONIZATION CROSS SECTION FOR  
ELECTRONS IN KRYPTON AND NITROGEN  
(IN ABSTRACTS OF) THE FIFTH INTERNATIONAL CONFERENCE ON THE  
PHYSICS OF ELECTRONIC AND ATOMIC COLLISIONS (LENINGRAD,  
USSR, 17-23 JULY 1967) PUBLISHING HOUSE NAUKA, LENINGRAD,  
PAGE 56, 1967
- 3052 DRACHMAN R J  
VARIATIONAL BOUNDS FOR ELASTIC POSITRON-ATOM SCATTERING  
(IN ABSTRACTS OF) THE FIFTH INTERNATIONAL CONFERENCE ON THE  
PHYSICS OF ELECTRONIC AND ATOMIC COLLISIONS (LENINGRAD,  
USSR, 17-23 JULY 1967) PUBLISHING HOUSE NAUKA, LENINGRAD,  
PAGE 106, 1967

- 3053 KRAIDY N, FRASER P A  
SCATTERING OF POSITRONS BY HELIUM AND THE RATE OF  
POSITRON ANNIHILATION IN HELIUM  
(IN ABSTRACTS OF) THE FIFTH INTERNATIONAL CONFERENCE ON THE  
PHYSICS OF ELECTRONIC AND ATOMIC COLLISIONS (LENINGRAD,  
USSR, 17-23 JULY 1967) PUBLISHING HOUSE NAUKA, LENINGRAD,  
PAGE 110, 1967
- 3054 MCCONNELL M R C, LLOYD D  
APPLICATIONS OF THE METHOD OF POLARIZED ORBITALS  
(IN ABSTRACTS OF) THE FIFTH INTERNATIONAL CONFERENCE ON THE  
PHYSICS OF ELECTRONIC AND ATOMIC COLLISIONS (LENINGRAD,  
USSR, 17-23 JULY 1967) PUBLISHING HOUSE NAUKA, LENINGRAD,  
PAGE 143, 1967
- 3055 BURKE P G, TAYLOR A J,  
ORMONDE S, WHITAKER M  
THRESHOLD BEHAVIOUR OF THE  $n=2$  EXCITATION CROSS SECTIONS  
IN ATOMIC H  
(IN ABSTRACTS OF) THE FIFTH INTERNATIONAL CONFERENCE ON THE  
PHYSICS OF ELECTRONIC AND ATOMIC COLLISIONS (LENINGRAD,  
USSR, 17-23 JULY 1967) PUBLISHING HOUSE NAUKA, LENINGRAD,  
PAGE 364, 1967
- 3056 BURKE P G, TAYLOR A J,  
COOPER J W, ORMONDE S  
THE SCATTERING OF ELECTRONS BY HELIUM ATOMS  
(IN ABSTRACTS OF) THE FIFTH INTERNATIONAL CONFERENCE ON THE  
PHYSICS OF ELECTRONIC AND ATOMIC COLLISIONS (LENINGRAD,  
USSR, 17-23 JULY 1967) PUBLISHING HOUSE NAUKA, LENINGRAD,  
PAGE 376, 1967
- 3057 HARRIOTT R, ROTENBERG M  
LOW ENERGY ELECTRON SCATTERING BY LITHIUM  
(IN ABSTRACTS OF) THE FIFTH INTERNATIONAL CONFERENCE ON THE  
PHYSICS OF ELECTRONIC AND ATOMIC COLLISIONS (LENINGRAD,  
USSR, 17-23 JULY 1967) PUBLISHING HOUSE NAUKA, LENINGRAD,  
PAGE 379, 1967
- 3058 RABIK L L  
THE EFFECT OF 'NEGATIVE ION' CONFIGURATIONS IN  
ELECTRON-ATOM COLLISIONS  
(IN ABSTRACTS OF) THE FIFTH INTERNATIONAL CONFERENCE ON THE  
PHYSICS OF ELECTRONIC AND ATOMIC COLLISIONS (LENINGRAD,  
USSR, 17-23 JULY 1967) PUBLISHING HOUSE NAUKA, LENINGRAD,  
PAGE 394, 1967
- 3059 LYASH A V, BOLOTIN A P  
EXTENDED METHOD AND MANY-CONFIGURATION APPROXIMATION  
IN THE THEORY OF ELECTRON-ATOM COLLISIONS  
(IN ABSTRACTS OF) THE FIFTH INTERNATIONAL CONFERENCE ON THE  
PHYSICS OF ELECTRONIC AND ATOMIC COLLISIONS (LENINGRAD,  
USSR, 17-23 JULY 1967) PUBLISHING HOUSE NAUKA, LENINGRAD,  
PAGE 397, 1967
- 3060 BEIGMAN I L, VAINSHTEIN L A,  
VINOGRAOV A V  
DOUBLE EXCITATION OF ATOMS BY ELECTRON IMPACT  
(IN ABSTRACTS OF) THE FIFTH INTERNATIONAL CONFERENCE ON THE  
PHYSICS OF ELECTRONIC AND ATOMIC COLLISIONS (LENINGRAD,  
USSR, 17-23 JULY 1967) PUBLISHING HOUSE NAUKA, LENINGRAD,  
PAGE 438, 1967
- 3061 KYLE H L, OMIDVAR K  
EXCITATION AND IONIZATION OF  $He^+$  (1S) BY ELECTRON IMPACT  
(IN ABSTRACTS OF) THE FIFTH INTERNATIONAL CONFERENCE ON THE  
PHYSICS OF ELECTRONIC AND ATOMIC COLLISIONS (LENINGRAD,  
USSR, 17-23 JULY 1967) PUBLISHING HOUSE NAUKA, LENINGRAD,  
PAGE 444, 1967
- 3062 OMIDVAR K, SULLIVAN E C  
IONIZATION OF MANY-ELECTRON ATOMS BY ELECTRON COLLISION  
(IN ABSTRACTS OF) THE FIFTH INTERNATIONAL CONFERENCE ON THE  
PHYSICS OF ELECTRONIC AND ATOMIC COLLISIONS (LENINGRAD,  
USSR, 17-23 JULY 1967) PUBLISHING HOUSE NAUKA, LENINGRAD,  
PAGE 452, 1967
- 3063 ALEKSACHIN I S, ZAPESCHNYI I P,  
SHPENIK O B  
CROSS SECTIONS FOR EXCITATION AND IONIZATION OF LITHIUM ATOMS  
BY ELECTRON IMPACT  
(IN ABSTRACTS OF) THE FIFTH INTERNATIONAL CONFERENCE ON THE  
PHYSICS OF ELECTRONIC AND ATOMIC COLLISIONS (LENINGRAD,  
USSR, 17-23 JULY 1967) PUBLISHING HOUSE NAUKA, LENINGRAD,  
PAGE 499, 1967
- 3064 SKUBENICH V V, ZAPESCHNYI I P  
SPECTROSCOPIC INVESTIGATION OF EXCITATION CROSS SECTIONS  
FOR MOLECULAR LEVELS  
(IN ABSTRACTS OF) THE FIFTH INTERNATIONAL CONFERENCE ON THE  
PHYSICS OF ELECTRONIC AND ATOMIC COLLISIONS (LENINGRAD,  
USSR, 17-23 JULY 1967) PUBLISHING HOUSE NAUKA, LENINGRAD,  
PAGE 570, 1967
- 3065 VAINSHTEIN L A, VINOGRAOV A V  
AN IMPACT PARAMETER TREATMENT OF ELECTRON-ATOM EXCITATION  
(IN ABSTRACTS OF) THE FIFTH INTERNATIONAL CONFERENCE ON THE  
PHYSICS OF ELECTRONIC AND ATOMIC COLLISIONS (LENINGRAD,  
USSR, 17-23 JULY 1967) PUBLISHING HOUSE NAUKA, LENINGRAD,  
PAGE 650, 1967
- 3066 MCCULLOH K F  
FRANCK-CONDON CALCULATIONS FOR DOUBLE IONIZATION OF MOLECULAR  
HYDROGEN  
J CHEM PHYS, VOL 48, 2090-2093, (1968)

- 3069 MIYAMOTO S ON THE EXCITATION OF O III ION IN 2P DOUBLET-CONFIGURATION BY THE ELECTRON IMPACT  
MEM COLL SCI KYOTO IMP UNIV, VOL A23, 467-479, (1941)
- 3071 BURROW P D INELASTIC COLLISIONS OF THE SECOND KIND BETWEEN ELECTRONS AND EXCITED MERCURY ATOMS  
THESIS, UNIVERSITY OF CALIFORNIA, BERKELEY, 1966, 61 PAGES, UNIVERSITY MICROFILMS INC, ANN ARBOR, MICHIGAN, NO. 67-8533
- 3202 NIGHAN W L LOW-ENERGY ELECTRON MOMENTUM TRANSFER COLLISIONS IN CESIUM PLASMAS  
PHYS FLUIDS, VOL 10, 1085-1094, (1967)
- 3203 TICE R, KIVFLSON D CYCLOTRON RESONANCE IN GASES. II. CROSS SECTIONS FOR DIPOLAR GASES AND FOR C O<sub>2</sub>  
J CHEM PHYS, VOL 46, 4748-4754, (1967)
- 3204 TICE R, KIVELSON D CYCLOTRON RESONANCE IN GASES. I. ATOMS AND NONPOLAR MOLECULES  
J CHEM PHYS, VOL 46, 4743-4747, (1967)
- 3205 FREUND R S, KLEMPERER W MOLECULAR BEAM TIME-OF-FLIGHT MEASUREMENTS FOR THE STUDY OF METASTABLE AND REPULSIVE ELECTRONIC STATES  
J CHEM PHYS, VOL 47, 2897-2904, (1967)
- 3206 MILLER K J, KRAUSS M INAPPLICABILITY OF THE BORN EXCHANGE SCATTERING AMPLITUDE FOR THE HE (1 SINGLET S TO 2 TRIPLET S) TRANSITION  
J CHEM PHYS, VOL 48, 2611-2614, (1968)
- 3207 SHARP T E, DOWELL J T DISSOCIATIVE ATTACHMENT OF ELECTRONS IN AMMONIA AND AMMONIA-D<sub>3</sub>  
J CHEM PHYS, VOL 50, 3024-3035, (1969)
- 3208 BELL K L, KINGSTON A F BORN CROSS SECTIONS FOR THE ELECTRON IMPACT EXCITATION OF THE 2 SINGLET S AND 3 SINGLET S STATES OF ATOMIC HELIUM  
J PHYS B PROC PHYS SOC 2, VOL 1, 521-523, (1968)
- 3209 VRIENS L, KUYATT C E, MIELCZAREK S R TESTS OF BORN APPROXIMATIONS. DIFFERENTIAL AND TOTAL CROSS SECTIONS FOR ELASTIC SCATTERING OF 100- TO 400-EV ELECTRONS BY HELIUM  
PHYS REV, VOL 170, 163-169, (1968)
- 3211 LIN S H CALCULATION OF ANISOTROPIC EXCITATION CROSS SECTIONS AND THE POLARIZATION OF IMPACT RADIATION OF HE ATOMS INDUCED BY ELECTRON AND PROTON IMPACTS  
J CHEM PHYS, VOL 48, 3125-3132, (1968)
- 3212 GOMET J C DETERMINATION EXPERIMENTALE DES SECTIONS EFFICACES ABSOLUES D'IONISATION PAR IMPACT ELECTRONIQUE DE L'EAU, DU BENZENE, DU TOULENE ET DU NAPHTHALENE  
METHODES PHYSIQUES D'ANALYSE (GAMS) PARIS, PP 71-76, (1967)
- 3214 VAN BLERKOM J ELECTRON COLLISION CROSS SECTIONS FOR THE 2L<sub>0</sub> TO 3L TRANSITIONS IN HYDROGEN  
J PHYS B PROC PHYS SOC 2, VOL 1, 423-427, (1968)
- 3215 SLOAN I H, MOORE E J INTEGRAL EQUATION APPROACH TO ELECTRON-HYDROGEN COLLISIONS  
J PHYS B PROC PHYS SOC 2, VOL 1, 414-422, (1968)
- 3216 MCCONNELL J C, MOISEWITSCH R L THE EXCITATION OF THE 6 SINGLET P<sub>1</sub> AND 6 TRIPLET P<sub>0,1,2</sub> STATES OF MERCURY BY ELECTRON IMPACT  
J PHYS B PROC PHYS SOC 2, VOL 1, 406-413, (1968)
- 3246 MCCONKEY J W, BURNS D J, WOOLSEY J M ABSOLUTE CROSS SECTIONS FOR IONIZATION AND EXCITATION OF C O<sub>2</sub> BY ELECTRON IMPACT  
J PHYS B PROC PHYS SOC, VOL 1, 71-76, (1968)
- 3248 YATES A C, STRAND T G RELATIVISTIC EFFECTS IN ELECTRON SCATTERING FROM ATOMS  
PHYS REV, VOL 170, 184-189, (1968)
- 3249 KOOZEKANANI S H EXCITATION CROSS SECTIONS FOR SOME OF THE STATES OF 2P QUARTET - 3P CONFIGURATION OF NEON AND 4P QUARTET - 5P CONFIGURATION OF KRYPTON  
IEEE J QUANTUM ELECTRON, VOL 4, 59-60, (1968)
- 3252 EHRHARDT H, LINDER F ROTATIONAL EXCITATION OF H<sub>2</sub> BY SLOW ELECTRONS IN A BEAM EXPERIMENT  
PHYS REV LETTERS, VOL 21, 419-421, (1968)
- 3255 KANG I J, CHOI C K ANGULAR DEPENDENCE OF 2 TRIPLET S EXCITATION OF HE BY HIGH-ENERGY ELECTRON IMPACT  
PHYS REV, VOL 171, 123-125, (1968)

- 3258 ARMSTEAD R L ELECTRON-HYDROGEN SCATTERING CALCULATION  
PHYS REV, VOL 171, 91-93, (1968)
- 3260 HENRY R J W POLARIZATION IN LOW-ENERGY ELECTRON SCATTERING - CARBON AND NITROGEN  
PHYS REV, VOL 172, 99-103, (1968)
- 3292 CHANTRY P J DISSOCIATIVE ATTACHMENT IN C O AND N O  
PHYS REV, VOL 172, 125-136, (1968)
- 3294 CZYZAK S J, KRUEGER T K, SARAPH M E, SNEHNING J EXCITATION OF FORBIDDEN LINES - CALCULATIONS FOR THE 2P TRIPLET, 2P QUARTET, 3P DOUBLET AND 3P QUARTET ISOELECTRONIC SEQUENCES  
PROC PHYS SOC LONDON, VOL 92, 1146-1147, (1967)
- 3296 PEART B, DOLDER K T MEASUREMENTS OF CROSS SECTIONS FOR THE IONIZATION OF LI+ AND BA+ IONS BY ELECTRON IMPACT  
J PHYS 9 PROC PHYS SOC 2, VOL 1, 872-878, (1968)
- 3322 GUK SIN SAN, OEVYATOV A M DETERMINATION OF EXCITATION FUNCTIONS. II. EXCITATION FUNCTIONS OF VARIOUS SPECTRAL LINES OF NEON IN ABSOLUTE UNITS  
VESTN MCK UNIV, VOL 2, 103-110, (1957)
- 3323 REDHEAD P A, FESER S MULTIPLE IONIZATION OF THE RAPE GASES BY SUCCESSIVE ELECTRON IMPACTS (0-250 EV). II. 15-25 TRANSITION IN TRIPLET HE+  
CAN J PHYS, VOL 46, 865-869, (1968)
- 3338 LEE A R, CARLETON M P EXCITATION OF (N2)+ IONS BY ELECTRONS AT NEAR THRESHOLD ENERGIES  
PHYS LETTERS, VOL 27A, 195-196, (1968)
- 3340 HERZENBERG A, LAU M S M RESONANCES AND EXCHANGE IN THE SCATTERING OF ELECTRONS BY HELIUM ATOMS. II. CORRELATED HELIUM WAVE FUNCTION  
J PHYS 9 PROC PHYS SOC 2, VOL 1, 336-348, (1968)
- 3341 KENNEDY D J THE IMPORTANCE OF CORRELATION IN THE EVALUATION OF BORN CROSS SECTIONS  
J PHYS 9 PROC PHYS SOC 2, VOL 1, 526-528, (1968)
- 3342 KARAIYANOV V ELASTIC SCATTERING OF ELECTRONS BY THE XENON ATOM  
IZV FIZ INST S ANEB BULGAR AKAD NAUK, VOL 17, 293-299, (1968)
- 3343 HALL R, MAZEAU J, REINHARDT J EXCITATION DE LA MOLECULE D'AZOTE PAR UN FAISCEAU D'ELECTRONS DANS LA GAMME D'ENERGIE 1-12 EV  
COMPT REND, VOL 266, 774-777, (1968)
- 3344 CARTWRIGHT D C THE EXCHANGE EXCITATION OF HELIUM AND THE HYDROGEN MOLECULE BY LOW ENERGY ELECTRONS  
THESIS, CALT-532-12, CALIF INST TECH, PASADENA, 1968, 305 PAGES
- 3348 FEAUTRIER N, LAN V K DIFFUSION ELASTIQUE DES ELECTRONS LENTS PAR LE LITHIUM ET L'ION BE+  
COMPT REND, VOL 267, 124-127, (1968)
- 3349 LANE M F, HENRY R J W POLARIZATION POTENTIAL IN LOW-ENERGY ELECTRON-H2 SCATTERING  
PHYS REV, VOL 173, 183-190, (1968)
- 3358 DRACHMAN R J VARIATIONAL BOUNDS IN POSITRON-ATOM SCATTERING  
PHYS REV, VOL 173, 190-202, (1968)
- 3370 BALL J S, CHEN J C Y, WONG D Y FADDEEV EQUATIONS FOR ATOMIC PROBLEMS AND SOLUTIONS FOR THE (S,H) SYSTEM  
PHYS REV, VOL 173, 282-283, (1968)
- 3371 MAGAN R M UPPER AND LOWER BOUNDS ON S-WAVE ELECTRON-HYDROGEN SCATTERING. I.  
PHYS REV, VOL 173, 214-221, (1968)
- 3373 WILLIAMS J F, MCGOWAN J W H(2P) EXCITATION RESONANCES IN (E-H) SYSTEM NEAR THRESHOLD  
PHYS REV LETTERS, VOL 21, 719-721, (1968)
- 3376 SKUDENICH V V EXCITATION CROSS SECTIONS OF CARBON MONOXIDE LEVELS BY ELECTRON COLLISIONS  
OPT SPECTRY USSR ENGLISH TRANSL, VOL 23, 548-541, (1967)
- 3377 EHRHARDT M, LANGHANS L, LINDER F, TAYLOR M S RESONANCE SCATTERING OF SLOW ELECTRONS FROM H2 AND C O ANGULAR DISTRIBUTIONS  
PHYS REV, VOL 173, 222-230, (1968)
- 3387 KOROL V I, KISHKO S M, SKUDENICH V V DETERMINATION OF EXCITATION CROSS SECTIONS OF SOME (O2)+ BANDS BY THE METHOD OF CROSSING BEAMS  
UKR FIZ ZH, VOL 13, 1225-1226, (1968)

- 3388 HARRIOTT R, ROTENBERG M POST-THRESHOLD BEHAVIOR OF THE CROSS SECTIONS FOR THE 1S-2P EXCITATION BY ELECTRON IMPACT  
PHYS REV LETTERS, VOL 21, 722-723, (1968)
- 3389 RONFESS H J W, SCHULZ G J VIBRATIONAL EXCITATION OF C O<sub>2</sub> BY ELECTRON IMPACT  
PHYS REV LETTERS, VOL 21, 1031-1034, (1968)
- 3391 ANDRICK D, FERNHARDT M, EYB M KURZLEBIGE COMPOUNDZUSTANDE IN DER NIEDERENERGETISCHEN ELEKTRON-HELIUM-STREUUNG  
Z PHYSIK, VOL 214, 388-401, (1968)
- 3394 JHA R, SIL N C ELASTIC SCATTERING OF ELECTRONS BY ATOMIC HYDROGEN  
INDIAN J PHYS, VOL 41, 875-881, (1967)
- 3400 MARTIN S O, PEART B, DOLDER K T MEASUREMENTS OF CROSS SECTIONS FOR THE IONIZATION OF MG<sup>+</sup> TO (MG)<sup>2+</sup> BY ELECTRON IMPACT  
J PHYS 9 PROC PHYS SOC 2, VOL 1, 537-542, (1968)
- 3404 KELLY M P OPTICAL-POTENTIAL CALCULATION OF ELECTRON-HYDROGEN SINGLET SCATTERING  
PHYS REV, VOL 171, 54-60, (1968)
- 3410 EMMHARDT M, LANGHANS L, LINDNER F DIE DIFFERENTIELLEN ANREGUNGSFUNKTIONEN DER N=2-ZUSTANDE VON HELIUM  
Z PHYSIK, VOL 214, 179-194, (1968)
- 3411 WEINBERG M, BERRY R S, TULLY J C QUANTUM DEFECT METHOD FOR LINEAR MOLECULES AND E-(H<sub>2</sub>)<sup>+</sup> SCATTERING  
J CHEM PHYS, VOL 49, 122-126, (1968)
- 3415 INOKUTI M, KIM Y K TOTAL CROSS SECTIONS FOR INELASTIC SCATTERING OF CHARGED PARTICLES BY ATOMS AND MOLECULES. II. NEGATIVE HYDROGEN ION  
PHYS REV, VOL 173, 154-160, (1968)
- 3416 KHVOSTENKO V I, SULTANOV A SH IONISATION OF THALLIUM(II) CHLORIDE, BROMIDE, AND IODIDE MOLECULES BY ELECTRON BOMBARDMENT  
RUSS J PHYS CHEM ENGLISH TRANSL, VOL 39, 252-253, (1965)
- 3417 KHVOSTENKO V I, SULTANOV A SH FORMATION OF NEGATIVE ALUMINUM, GALLIUM, INDIUM AND THALLIUM IONS ON THE CAPTURE OF ELECTRONS BY MOLECULES OF HALIDES OF THESE ELEMENTS  
SOVIET PHYS JETP ENGLISH TRANSL, VOL 19, 1086-1087, (1966)
- 3418 ZAPESCHNYI I P, SHPENIK O B RESONANCE NATURE OF EXCITATION OF MERCURY ATOMS IN COLLISIONS WITH SLOW ELECTRONS  
SOVIET PHYS DOKLADY ENGLISH TRANSL, VOL 10, 140-143, (1965)
- 3419 ZAPESCHNYI I P, SHEVERA V S ON FUNCTION OF THE VISIBLE TRIPLET CADMIUM S TRIPLET P 812 - 6 TRIPLET S 1  
UKR FIZ ZH, VOL 5, 650-654, (1968)
- 3422 JHA R, BANERJEE S N, SIL N C ELASTIC SCATTERING OF ELECTRONS BY HELIUM ATOM  
INDIAN J PHYS, VOL 41, 891-896, (1967)
- 3425 NYGAARD K J ELECTRON-IMPACT IONIZATION CROSS SECTION IN CESIUM  
J CHEM PHYS, VOL 49, 1995-2002, (1968)
- 3426 KOOZEKAWANI S M EXCITATION CROSS SECTION FOR SOME OF THE DOUBLY IONIZED STATES OF ARGON, NEON, AND KRYPTON BY FAST ELECTRONS  
J APPL PHYS, VOL 39, 4799-4806, (1968)
- 3427 KHAIKIN A S RATES OF TRANSITIONS BETWEEN NEON EXCITED LEVELS INDUCED BY ELECTRON COLLISIONS  
SOVIET PHYS JETP ENGLISH TRANSL, VOL 27, 28-33, (1968)
- 3427 KINGSTON A E CLASSICAL CROSS SECTIONS FOR THE ELECTRON IONIZATION OF THE DEGENERATE LEVELS OF THE EXCITED STATES OF ATOMIC HYDROGEN  
J PHYS 9 PROC PHYS SOC 2, VOL 1, 559-566, (1968)
- 3431 SCHLESSINGER L CALCULATION OF SOME THREE-BODY SCATTERING AMPLITUDES  
PHYS REV, VOL 171, 1523-1527, (1968)
- 3432 KARSTENSEN P RELATIVE ANREGUNGSQUERSCHNITTE FUR ELEKTROSTOSS BEIM SINGULETT-SYSTEM DES KALZIUM  
Z ASTROPHYSIK, VOL 60, 214-219, (1968)
- 3433 SCHACKERT K SPINPOLARISATION LANGSAMER ELEKTROEN DURCH ELASTISCHE STREUUNG AN EDELGASATOMSTRAHLEN  
Z PHYSIK, VOL 213, 316-322, (1968)
- 3434 MERTZ I V, ROSS K J ELECTRON-IMPACT EXCITATION OF THE 6 DOUBLET P STATES IN CESIUM  
PHYS REV LETTERS, VOL 21, 1511-1512, (1968)

- 3516 SKLAREN R C, CALLAWAY J  
ELASTIC SCATTERING OF LOW-ENERGY ELECTRONS FROM METASTABLE HELIUM  
PHYS REV, VOL 175, 103-112, (1968)
- 3518 BURKE P G, MOORES D L  
SCATTERING OF ELECTRONS BY  $Mg^+$  AND  $Ca^+$  IONS  
J PHYS B PROC PHYS SOC 2, VOL 1, 575-585, (1968)
- 3519 HERTEL I V, ROSS K J  
ELECTRON COLLISION CROSS SECTIONS AND GENERALIZED OSCILLATOR STRENGTHS FOR POTASSIUM  
J PHYS B PROC PHYS SOC 2, VOL 1, 697-704, (1968)
- 3521 KIM Y K, INOKUTI M  
GENERALIZED OSCILLATOR STRENGTHS OF THE HELIUM ATOM. I.  
PHYS REV, VOL 175, 176-180, (1968)
- 3522 MCDONELL M R C  
ELASTIC SCATTERING OF SLOW ELECTRONS BY TWO-ELECTRON IONS  
PHYS REV, VOL 175, 189-196, (1968)
- 3524 SRIVASTAVA B N, MIRZA I M  
MEASUREMENTS OF THE ELECTRON IMPACT EXCITATION CROSS SECTION OF  $(He^+)$  FIRST NEGATIVE BANDS  
PHYS REV, VOL 176, 137-140, (1968)
- 3525 KOOZEKANANI S M  
FORMATION OF IONIZED EXCITED STATES THROUGH THE LOSS OF THE METASTABLE ELECTRON IN NOBLE-GAS ATOMS  
PHYS REV, VOL 176, 160-163, (1968)
- 3526 KYLE M L, OMIDVAR K  
ELECTRON-IMPACT IONIZATION OF  $He(2s)$  AND  $He(2p)$   
PHYS REV, VOL 176, 164-172, (1968)
- 3527 PERESSE J, TUFFIN F  
DETERMINATION EXPERIMENTALE DES SECTIONS EFFICACES ABSOLUES, POUR CHAQUE TYPE D'IONS CREES A PARTIR DE  $O_2$ ,  $N_2$ ,  $C O_2$ , ET  $C H_4$ , PAR IMPACTS ELECTRONIQUES  
METHODES PHYS D'ANALYSE (GANS), PAGES 3-6, (1967)
- 3528 ZAPESCHNYI I P, ZHUKOV I G, GARGA I I, VUKSTICH V S  
SET-UP WITH VACUUM MONOCHROMATOR FOR THE INVESTIGATION OF OPTICAL EXCITATION FUNCTIONS  
UKR FIZ ZH, VOL 9, 196-205, (1964)
- 3531 KRIGE G J, GORDON S W, HAARMOFF P C  
IONIZATION OF HELIUM NEAR THRESHOLD BY ELECTRON IMPACT  
Z NATURFORSCH, VOL 23A, 1383-1389, (1968)
- 3541 HOUSTAFI MOUSSA M R, DE MEER F J  
EXCITATION OF HELIUM TO EXCITED ION STATES BY ELECTRON AND PROTON IMPACT  
PHYSICA, VOL 36, 646-654, (1967)
- 3543 BURTON P D, DAVIDOVITS P  
DETECTION OF VIBRATIONALLY EXCITED  $N_2$  BY SUPERELASTIC ELECTRON IMPACT  
PHYS REV LETTERS, VOL 21, 1789-1791, (1968)
- 3545 TRAJMAN S, CARTRIGHT D C, RICE J H, BRINKMAN R T, KUPPERMAN A  
ANGULAR DEPENDENCE OF LOW-ENERGY ELECTRON-IMPACT EXCITATION CROSS SECTION OF THE LOWEST TRIPLET STATES OF  $N_2$   
J CHEM PHYS, VOL 49, 5464-5472, (1968)
- 3546 SKERBELE A, DILLON M A, LASSETYRE E N  
FORBIDDEN VIBRATIONAL TRANSITIONS IN THE ELECTRON-IMPACT SPECTRA OF MOLECULAR OXYGEN AND NITROGEN  
J CHEM PHYS, VOL 49, 3543-3545, (1968)
- 3547 SKERBELE A, DILLON M A, LASSETYRE E N  
EXCITATION BY ELECTRON IMPACT OF VIBRATIONAL TRANSITIONS IN WATER AND CARBON DIOXIDE AT KINETIC ENERGIES BETWEEN 30 AND 80 EV  
J CHEM PHYS, VOL 49, 5842-5846, (1968)
- 3548 SCHEARER L D  
SPIN EXCHANGE BETWEEN OPTICALLY ORIENTED METASTABLE HELIUM ATOMS AND THERMAL ELECTRONS IN A FLOWING AFTERGLOW  
PHYS REV, VOL 171, 81-84, (1968)
- 3549 DOUGHTY M A, SEATON N J, SMOOREY V B  
QUANTUM DEFECT THEORY. VI. EXTRAPOLATIONS ALONG ISOELECTRONIC SEQUENCES  
J PHYS B PROC PHYS SOC 2, VOL 1, 802-812, (1968)
- 3548 VOLKOV YU M, ZINOVY O A, MALYUTA O D  
MEASUREMENT OF DIFFUSION CROSS SECTIONS OF SLOW ELECTRONS IN INERT GASES BY A MICROWAVE METHOD  
HIGH TEMP USSR ENGLISH TRANSL, VOL 6, 207-215, (1968)
- 3549 PERESSE J  
DETERMINATION EXPERIMENTALE DES SECTIONS EFFICACES D'IONISATION DE  $N_2$ ,  $He$ ,  $Ne$ ,  $Ar$ ,  $Kr$ ,  $Xe$ , PAR CHOCS ELECTRONIQUES  
METHODES PHYS D'ANALYSE (GANS), PAGE 133, (1968)
- 3550 HAUG R  
ELASTISCHE STREUUNG LANGSAMER ELEKTROEN AN EINEM  $He$ -ATOMSTRAL  
Z PHYSIK, VOL 219, 350-355, (1968)

- 3572 PERESSE J  
EXPRESSIONS ANALYTIQUES THEORIQUES DE SECTIONS EFFICACES D'EXCITATION PAR CHOCS ELECTRONIQUES POUR LA TRANSITION 1S-2S DE L'HYDROGENE ATOMIQUE  
METHODES PHYS D'ANALYSE (GAMS), PAGE 31, (1965)
- 3574 TAKAYANAGI K, TAKAHASHI T  
EFFECTIVE CROSS SECTIONS FOR COLLISION PROCESSES BETWEEN MOLECULAR OXYGEN AND SLOW ELECTRONS  
BULL INST SPACE AERONAUTICAL SCI U TOKYO, VOL 3, 521, (1967)
- 3578 SKUBENICH V V  
EXCITATION OF MOLECULAR OXYGEN BY LOW ENERGY ELECTRONS  
OPT SPECTRY USSR ENGLISH TRANSL, VOL 25, 98-91, (1968)
- 3579 LYASH A V, BOLOTIN A P  
EXTENDED METHOD AND MANY-CONFIGURATION APPROXIMATION IN THE THEORY OF ELECTRON-ATOMIC COLLISIONS  
LIETUVOS FIZ RINKINYS, VOL 7, 341-359, (1967)
- 3580 GAUDIN A, BOTTER R  
CALCUL DE SECTIONS EFFICACES D'IONISATION D'ATOMES PAR IMPACT ELECTRONIQUE ENERGIQUE. I. ETABLISSEMENT DES FORMULES  
J CHIM PHYS, VOL 65, 1112-1117, (1968)
- 3581 GAUDIN A, BOTTER R  
CALCUL DE SECTIONS EFFICACES D'IONISATION D'ATOMES PAR IMPACT ELECTRONIQUE ENERGIQUE. II. SECTIONS EFFICACES D'IONISATION DE HE, LI, BE, B, C, N, O, F, NE  
J CHIM PHYS, VOL 65, 1118-1125, (1968)
- 3582 GAUDIN A, BOTTER R  
CALCUL DE SECTIONS EFFICACES D'IONISATION D'ATOMES PAR IMPACT ELECTRONIQUE ENERGIQUE. III. SECTIONS EFFICACES D'IONISATION DE NA, MG, AL, SI, P, S, CL, A  
J CHIM PHYS, VOL 65, 1126-1128, (1968)
- 3583 JOSE J D  
EXCITATION PROCESSES IN HELIUM  
THESIS, UNIVERSITY OF OKLAHOMA, 1968, 185 PAGES, UNIVERSITY MICROFILMS, INC, ANN ARBOR, MICHIGAN, NO. 68-9639
- 3584 VRIENS L, BONSEN T F W  
DIFFERENTIAL CROSS SECTIONS FOR IONIZATION OF THE HYDROGEN ATOM BY FAST CHARGED PARTICLES IN THE BINARY-ENCOUNTER THEORY AND BETHE THEORY  
J PHYS S PROC PHYS SOC 2, VOL 1, 1123-1130, (1968)
- 3585 PEACH G  
IONIZATION OF NEUTRAL ATOMS WITH OUTER 2P AND 3P ELECTRONS BY ELECTRON AND PROTON IMPACT  
J PHYS S PROC PHYS SOC 2, VOL 1, 1088-1100, (1968)
- 3586 HOUSTON S K  
ELASTIC SCATTERING OF ZERO-ENERGY ELECTRONS BY HELIUM ATOMS  
J PHYS S PROC PHYS SOC 2, VOL 1, 1077-1082, (1968)
- 3587 BELL K L, KENNEDY D J, KINGSTON A E  
BORN CROSS SECTIONS FOR THE ELECTRON AND PROTON EXCITATION OF HELIUM CALCULATED USING UNRESTRICTED HARTREE-FOCK WAVE FUNCTIONS  
J PHYS S PROC PHYS SOC 2, VOL 1, 1028-1036, (1968)
- 3589 LONG D B  
MEASUREMENT OF THE ABSOLUTE ELECTRON IMPACT IONIZATION CROSS SECTION OF THE METASTABLE HE(2S TRIPLET S) STATE OF HELIUM USING THE DOUBLE ELECTRON BEAM TECHNIQUE  
THESIS, UNIVERSITY OF WASHINGTON, SEATTLE, 1967, 149 PAGES, UNIVERSITY MICROFILMS, INC, ANN ARBOR, MICHIGAN, NO. 67-14,100
- 3590 ZAPESCHNYI I P  
TRENDS IN THE ELECTRON-IMPACT EXCITATION CROSS SECTIONS FOR THE LOWER LEVELS OF HELIUM  
SOVIET PHYS DOKL ENGLISH TRANSL, VOL 11, 961, (1967)
- 3616 VAVERSKY B  
THE MOTION OF AN ELECTRON IN THE FIELD OF A MERCURY ATOM  
ZH EKSPERIM I TEOR FIZ, VOL 22, 636-638, (1952)
- 3641 JAGER K, MENGELEIN A  
DIE BILDUNG NEGATIVER IONEN AUS SI CL4 UND ORGANISCHEN SILICIUMCHLORIDEN DURCH ELEKTROENSTOSS  
Z NATURFORSCH, VOL 23A, 1122-1127, (1968)
- 3642 KOLODZIEJSKI R  
THEORETICAL AND NUMERICAL STUDY OF THE 1S-2S EXCITATION OF ATOMIC HYDROGEN BY SLOW ELECTRONS  
ACTA PHYS POLON, VOL 33, 991-1006, (1968)
- 3643 WANG K L, BRODY R D, CRAWFORD C K  
ELECTRON IMPACT IONIZATION CROSS SECTIONS  
TECHNICAL REPORT AFML-TR-69-5 (POL-TR-3), AF MATERIALS LAB, WPAFB, OHIO 45433, 1969, 56 PAGES
- 3645 PETERKOP R K  
ELASTIC SCATTERING OF ELECTRONS BY HELIUM ATOMS  
SOVIET PHYS JETP ENGLISH TRANSL, VOL 27, 846-850, (1968)
- 3646 BOIKOVA B F, OREKOV V O  
ROTATIONAL AND VIBRATIONAL EXCITATION OF MOLECULAR IONS BY ELECTRONS  
SOVIET PHYS JETP ENGLISH TRANSL, VOL 27, 772-774, (1968)

- 3686 MICHELS H H, HARRIS F E, SCOLSKY R M  
CALCULATION OF CROSS-SECTIONS FOR ELECTRON-HELIUM COLLISIONS  
PHYS LETTERS, VOL 28A, 467-468, (1969)
- 3687 AARTS J F M, DE MEER F J, VROON D A  
EMISSION CROSS SECTIONS OF THE FIRST NEGATIVE BAND SYSTEM OF  
N<sub>2</sub> BY ELECTRON IMPACT  
PHYSICA, VOL 48, 197-206, (1968)
- 3693 DOLGOV-SAVEL'Y G G, PANCHENKO V  
CROSS SECTIONS FOR THE EXCITATION OF THE K SERIES OF ARGON BY  
ELECTRON COLLISION  
OPT SPECTRY USSR ENGLISH TRANSL, VOL 25, 270-272, (1968)
- 3698 VAINSHTEIN L A, PRESNYAKOV L  
THE ROLE OF INTERMEDIATE STATES IN THE EXCITATION OF ATOMS BY  
ELECTRON IMPACT  
SOVIET PHYS JETP ENGLISH TRANSL, VOL 28, 156-159, (1969)
- 3699 ZAPESCHNYI I P, ALEKSAKHIN I S  
IONIZATION OF ALKALI METAL ATOMS BY SLOW ELECTRONS  
SOVIET PHYS JETP ENGLISH TRANSL, VOL 28, 41-45, (1969)
- 3700 HENRY R J M, BURKE P E, SINFAILAN A L  
SCATTERING OF ELECTRONS BY C, N, O, N<sup>+</sup>, O<sup>+</sup>, AND O<sup>++</sup>  
PHYS REV, VOL 178, 210-225, (1969)
- 3701 GARRETT M R  
NONADIABATIC ATOMIC DISTORTION IN LOW-ENERGY ELECTRON AND  
POSITRON SCATTERING  
PHYS REV, VOL 178, 210-217, (1969)
- 3702 HOFFMANN C R, SKARSGARD M H  
MOMENTUM-TRANSFER CROSS SECTIONS AND CONDUCTIVITY RATIOS FOR  
LOW-ENERGY ELECTRONS IN HE, NE, NR, AND Xe  
PHYS REV, VOL 178, 168-175, (1969)
- 3704 SMITH K, CONNEELY M J, MORGAN L A  
TRIAL WAVE FUNCTIONS IN THE CLOSE-COUPLED APPROXIMATION  
PHYS REV, VOL 177, 196-203, (1969)
- 3705 ROY A C  
THE ELASTIC SCATTERING OF ELECTRONS BY HELIUM ATOMS AT A LOW  
ENERGY  
INDIAN J PURE APPL PHYS, VOL 6, 461-464, (1968)
- 3706 TAKAYANAGI K, IYIKAWA Y  
ROTATIONAL EXCITATION OF THE INTERSTELLAR C N MOLECULE  
PUBL ASTRON SOC JAPAN, VOL 28, 376-384, (1968)
- 3707 IYIKAWA Y, TAKAYANAGI K  
ROTATIONAL TRANSITION IN POLAR MOLECULES BY ELECTRON  
COLLISIONS - APPLICATIONS TO C N AND H CL  
J PHYS SOC JAPAN, VOL 26, 1254-1264, (1969)
- 3709 NATHUR K C, TRIPATHI A N, JOSHI S K  
EXCITATION OF ALKALI ATOMS BY ELECTRON IMPACT  
J CHEM PHYS, VOL 50, 2988-2993, (1969)
- 3710 STANTON P N, ST JOHN D H  
ELECTRON EXCITATION OF THE FIRST POSITIVE BANDS OF N<sub>2</sub> AND OF  
THE FIRST NEGATIVE AND MEINEL BANDS OF (N<sub>2</sub>)<sup>+</sup>  
J OPT SOC AM, VOL 59, 252-260, (1969)
- 3720 TRUMER D C, CARTWRIGHT D C, KUPPERMANN A  
REARRANGEMENT COLLISIONS - EFFECT OF CORE TERMS,  
NONORTHOGONALITY, AND CONSERVATION OF PARTICLE FLUX ON  
APPROXIMATE THEORIES  
PHYS REV, VOL 179, 113-133, (1969)
- 3729 MOUSTAFA MOUSSA M R, DE MEER F J, SCHUTTEN J  
EXCITATION OF HELIUM BY 0.05-6 KEV ELECTRONS AND POLARIZATION  
OF THE RESULTING RADIATION  
PHYSICA, VOL 46, 517-549, (1969)
- 3730 VAN DEN BOS J  
EXCITATION OF HELIUM BY PROTONS AND ELECTRONS  
PHYSICA, VOL 42, 249-261, (1968)
- 3731 WALKER D M  
RELATIVISTIC AND EXCHANGE EFFECTS IN ELECTRON SCATTERING FROM  
MERCURY  
J PHYS & ATOM MOL PHYS 2, VOL 2, 356-366, (1969)
- 3732 EISSNER W, MUSSBAUMER M, SARAPH M E, SEATON M J  
RESONANCES IN CROSS SECTIONS FOR EXCITATION OF FORBIDDEN LINES  
IN (O<sub>2</sub>)<sup>+</sup>  
J PHYS & ATOM MOL PHYS 2, VOL 2, 341-355, (1969)
- 3733 BELL K L, KENNEDY O J, KINGSTON A E  
ACCURATE FIRST BORN APPROXIMATION CROSS SECTIONS FOR THE  
EXCITATION OF HELIUM BY FAST ELECTRONS  
J PHYS & ATOM MOL PHYS 2, VOL 2, 16-43, (1969)
- 3734 BURKE P E, TAYLOR A J  
THE EXCITATION OF He<sup>+</sup> BY ELECTRON IMPACT  
J PHYS & ATOM MOL PHYS 2, VOL 2, 66-91, (1969)
- 3735 TRIPATHI A N, NATHUR K C, JOSHI S K  
IMPACT IONIZATION OF Na, K, Rb AND Cs BY ELECTRON AND PROTON  
IMPACTS  
J PHYS & ATOM MOL PHYS 2, VOL 2, 155-168, (1969)

- 3736 BELV O, SCHWARTZ S R  
ELECTRON DETACHMENT FROM H- BY ELECTRON IMPACT  
J PHYS B ATOM MOL PHYS 2, VOL 2, 159-161, (1969)
- 3737 LUFFMAN B L  
EXCHANGE CROSS SECTIONS FOR THE IONIZATION OF ATOMIC HYDROGEN  
J PHYS B ATOM MOL PHYS 2, VOL 2, 162-169, (1969)
- 3738 MOHR C B O  
CHANNEL-COUPLING EFFECTS IN ELASTIC COLLISIONS OF ELECTRONS  
WITH ATOMS  
J PHYS B ATOM MOL PHYS 2, VOL 2, 166-174, (1969)
- 3739 MARTINS P DE A P, SARAPH H P, SEATON M J  
ELECTRON IMPACT TRANSITIONS BETWEEN FINE STRUCTURE LEVELS IN  
IONS WITH CONFIGURATIONS 1S DOUBLET 2S DOUBLET 2P TRIPLET  
J PHYS B ATOM MOL PHYS 2, VOL 2, 427-431, (1969)
- 3742 ORMONDE S, WHITAKER W, HUEDNER M, BURKE P G  
CLOSE COUPLING CALCULATIONS OF LOW-ENERGY ELECTRON SCATTERING.  
HYDROGEN ATOMS - VOLUME I  
TECHNICAL REPORT NO AFML-TR-67-10, VOL 1, KIRTLAND AFB,  
NEW MEXICO, 1969, 134 PAGES
- 3743 MASTED J B, ANAN A M  
RESONANCE SCATTERING OF ELECTRONS BY DIATOMIC MOLECULES  
J PHYS B ATOM MOL PHYS 2, VOL 2, 367-380, (1969)
- 3744 PEIKOTO E H A  
NONRELATIVISTIC PARTIAL-WAVE SCATTERING OF ELECTRONS BY  
IONIZED ATOMS  
PHYS REV, VOL 177, 204-211, (1969)
- 3745 GARCIA J O  
EJECTED ELECTRON DISTRIBUTIONS  
PHYS REV, VOL 177, 223-229, (1969)
- 3746 ONIGVAR K  
BEHAVIOR OF THE IONIZATION CROSS SECTION IN COLLISIONS OF  
HIGH-ENERGY ELECTRONS WITH HYDROGENIC ATOMS  
PHYS REV, VOL 177, 212-218, (1969)
- 3747 ENHARDT M, SCHULZ M, TERAAT Y, WILLHANN K  
IONIZATION OF HELIUM - ANGULAR CORRELATION OF THE SCATTERED  
AND EJECTED ELECTRONS  
PHYS REV LETTERS, VOL 22, 89-92, (1969)
- 3748 WHITTERER J M  
POLARIZATION OF ELECTRON IMPACT LIGHT FROM HELIUM  
UNIVERSITY OF BRITISH COLUMBIA, 1967, 109 PAGES, NATIONAL  
LIBRARY OF CANADA, OTTAWA 2, NO. 1626
- 3749 KHARE S P  
ANGULAR DISTRIBUTION OF ELECTRONS ELASTICALLY SCATTERED BY  
HELIUM ATOMS  
PHYS LETTERS, VOL 29A, 359-360, (1969)
- 3750 THOMAS B K, GARCIA J O  
IONIZATION OF POSITIVE IONS  
PHYS REV, VOL 179, 94-101, (1969)
- 3751 CLAMPITT R, NEWTON A S  
METASTABLE SPECIES PRODUCED BY ELECTRON EXCITATION OF N<sub>2</sub>,  
N<sub>2</sub><sup>+</sup>, N<sub>2</sub>O, AND C O<sub>2</sub>  
J CHEM PHYS, VOL 50, 1997-2001, (1969)
- 3752 CORVIN K K, CORRIGAN S J O  
DISSOCIATION OF CARBON DIOXIDE IN THE POSITIVE COLUMN OF A  
GLOW DISCHARGE  
J CHEM PHYS, VOL 50, 2570-2574, (1969)
- 3753 MCCOMNEY J W, WOOLSEY J M  
EXCITATION OF (02)+ BANDS BY ELECTRON IMPACT  
J PHYS B ATOM MOL PHYS 2, VOL 2, 529-533, (1969)
- 3754 BURNS B J, SIMPSON F P, MCCOMNEY J W  
ABSOLUTE CROSS SECTIONS FOR ELECTRON EXCITATION OF THE SECOND  
POSITIVE BANDS OF NITROGEN  
J PHYS B ATOM MOL PHYS 2, VOL 2, 52-64, (1969)
- 3755 COMPTON R M, STOCKDALE J A, REINHARDT P W  
ELECTRON-IMPACT EXCITATION AND NEGATIVE-ION FORMATION IN  
N H<sub>3</sub> AND N O<sub>2</sub>  
PHYS REV, VOL 180, 111-120, (1969)
- 3757 MERZEL G M  
EXCITATION PROCESSES IN THE ARGON ION LASER  
THESIS, YALE UNIVERSITY, 1967, 85 PAGES, UNIVERSITY  
MICROFILMS INC, ANN ARBOR MICHIGAN, NO. 60-5104
- 3758 LATVON Z Z, KUPCHENKO I E  
IONIZATION OF H<sub>2</sub><sup>+</sup> IONS BY ELECTRON IMPACT  
SOVIET PHYS TECH PHYS ENGLISH TRANSL, VOL 13, 811, (1968)
- 3759 SRIVASTAVA S N, MISHRA I M  
EXCITATION FUNCTION OF THE (1P)<sub>1</sub> HEISEL BAND BY ELECTRON  
IMPACT  
CAN J PHYS, VOL 47, 475-476, (1969)
- 3770 ANDRICH A, GAMER G, ENHARDT M  
VIBRATIONAL EXCITATION OF C O<sub>2</sub> BY DIPOLE INTERACTION WITH  
SLOW ELECTRONS  
PHYS LETTERS, VOL 29A, 360-367, (1969)

- 3771 HALLING L C PHASE-SHIFT CALCULATION FOR LOW-ENERGY ELECTRON-RR SCATTERING  
PHYS REV, VOL 179, 78-84, (1969)
- 3772 LABAHN R W, CALLAWAY J DISTORTION EFFECTS IN THE ELASTIC SCATTERING OF 100- TO  
400-EV ELECTRONS FROM HELIUM  
PHYS REV, VOL 188, 91-96, (1969)
- 3773 YATES A C, FINK M SENSITIVITY OF SPIN POLARIZATION TO SCATTERING POTENTIAL  
PHYS REV LETTERS, VOL 22, 1-3, (1969)
- 3774 TAI M, TEUBNER P J, ANGULAR DISTRIBUTIONS OF ELASTICALLY SCATTERED ELECTRONS  
FROM HYDROGEN  
RUSSEL R M  
PHYS REV LETTERS, VOL 22, 1419, (1969)
- 3775 KYLF M L, MCDONELL M P C PEAKING APPROXIMATIONS IN ATOMIC SCATTERING PROBLEMS  
NASA TM X-63269, GODDARD SPACE FLIGHT CENTER, GREENBELT,  
MARYLAND, 1968, 12 PAGES
- 3776 HERTEL I V, ROSS K J OCTAPOLE-ALLOWED TRANSITIONS IN THE ELECTRON ENERGY-LOSS  
SPECTRA OF POTASSIUM AND RUBIDIUM  
J CHEM PHYS, VOL 50, 936-937, (1969)
- 3777 HERTEL I V, ROSS K J GENERALIZED OSCILLATOR STRENGTHS IN THE ELECTRON IMPACT  
SPECTRA OF RUBIDIUM AND CAESIUM  
J PHYS 9 ATOM MOL PHYS 2, VOL 2, 484-489, (1969)
- 3778 HERTEL I V, ROSS K J GENERALIZED OSCILLATOR STRENGTHS IN THE ELECTRON IMPACT  
SPECTRA OF POTASSIUM AND SODIUM  
J PHYS 9 ATOM MOL PHYS 2, VOL 2, 285-293, (1969)
- 3881 MCDONALD F A, NUTTALL J COMPLEX-ENERGY METHOD FOR ELASTIC F-W SCATTERING ABOVE THE  
IONIZATION THRESHOLD  
PHYS REV LETTERS, VOL 27, 361-363, (1969)
- 3882 MEISTER M J, WEISS M F NUMERICAL COMPARISON BETWEEN RELATIVISTIC AND NONRELATIVISTIC  
THEORY FOR SCATTERING OF SLOW ELECTRONS FROM ATOMS  
Z PHYSIK, VOL 216, 165-171, (1968)
- 3883 PROK G M, HONNIN C F, MOLECULAR HYDROGEN INELASTIC ELECTRON IMPACT CROSS SECTIONS--  
A SEMICLASSICAL METHOD  
METTEL M J  
J QUANT SPECTRY RADIATIVE TRANSFER, VOL 9, 361-369, (1969)
- 3884 TRIPATHI D N, RAI D K, ON THE ATOMIC SHELL STRUCTURE IN IONISATION CROSS SECTION  
TINARI P  
PHYS LETTERS, VOL 28A, 757-758, (1969)
- 3885 OCHKUR V I THE EXCHANGE CORRECTION TO THE AMPLITUDE OF DIRECT SCATTERING  
OF ELECTRONS FROM ATOMS  
OPT SPECTRY USSR ENGLISH TRANSL, VOL 25, 934-935, (1968)
- 3886 ABRAH R A, HERZENBERG A ROTATIONAL EXCITATION OF H<sub>2</sub> BY SLOW ELECTRONS  
CHEM PHYS LETTERS, VOL 3, 187-190, (1969)
- 3887 IONIKH VU Z EFFECTIVE CROSS SECTIONS FOR EXCITATION OF HELIUM FROM THE  
2 SINGLET S STATE BY ELECTRON IMPACT  
OPT SPECTRY USSR ENGLISH TRANSL, VOL 26, 15-17, (1969)
- 3888 BRION C E THE FRANK-CONDON PRINCIPLE AND THE IONIZATION OF ACETYLENE  
BY ELECTRON IMPACT  
CHEM PHYS LETTERS, VOL 3, 9-11, (1969)
- 3889 SHERBET A, ROSS K J, ELECTRON-IMPACT SPECTRUM OF MERCURY VAPOR  
LASSETTIE E M  
J CHEM PHYS, VOL 50, 4486-4493, (1969)
- 3890 BROMBERG M M, OOSTERHOFF L J SINGLET-TRIPLET EXCITATION OF SATURATED HYDROCARBONS BY  
LOW-ENERGY ELECTRON IMPACT  
CHEM PHYS LETTERS, VOL 3, 437-440, (1969)
- 3891 EITEL W, JOST K, RANGE OF VALIDITY OF STATIC POTENTIAL APPROXIMATION IN  
RESSEL J  
LOW-ENERGY ELECTRON SCATTERING CHECKED BY CROSS SECTION  
MEASUREMENTS OF H<sub>2</sub> BETWEEN 25 AND 150 EV  
Z NATURFORSCH, VOL 23A, 2122-2123, (1968)
- 3892 VROOM D A, DE MEER F J PRODUCTION OF EXCITED HYDROGEN ATOMS BY IMPACT OF FAST  
ELECTRONS ON WATER VAPOR  
J CHEM PHYS, VOL 50, 1883-1887, (1969)
- 3893 KUPFERMAN A, RICE J V, LOW-ENERGY, HIGH-ANGLE ELECTRON-IMPACT SPECTROMETRY  
TRAJMAN S  
J PHYS CHEM, VOL 72, 3896-3903, (1968)
- 3894 LASSETTIE E M, SHERBET A, GENERALIZED OSCILLATOR STRENGTH FOR 1 SINGLET S - 2 SINGLET P  
DILLON M A  
TRANSITION OF HELIUM. THEORY OF LIMITING OSCILLATOR STRENGTHS  
J CHEM PHYS, VOL 50, 1829-1839, (1969)

- 3817 BROMBERG J P  
ABSOLUTE DIFFERENTIAL CROSS SECTIONS OF ELASTICALLY SCATTERED  
ELECTRONS. I - HE, NE, AND C O AT 500 EV  
J CHEM PHYS, VOL 50, 3906-3921, (1969)
- 3819 VAN DER NIEL H J, EL-SHERBINTI TH, VRIFNS L  
MULTIPLE IONIZATION OF HE, NE AND AR BY 2-16 KEV ELECTRONS  
PHYSICA, VOL 42, 411-420, (1969)
- 3822 FRANCO V  
DIFFRACTION THEORY OF SCATTERING BY HYDROGEN ATOMS  
PHYS REV LETTERS, VOL 20, 709-712, (1968)
- 3823 MILLER K J, NIELCZAPK S R, KRAUSS M  
ENERGY SURFACE AND GENERALIZED OSCILLATOR STRENGTH OF THE  
SINGLELY A DOUBLE PRIME RYDBERG STATE OF H2O  
J CHEM PHYS, VOL 51, 26-32, (1969)
- 3824 RIDGE D P, BEAUCHAMP J L  
APPLICATION OF ION CYCLOTRON RESONANCE TO THE STUDY OF  
INELASTIC EXCITATION BY LOW-ENERGY ELECTRONS  
J CHEM PHYS, VOL 51, 478-471, (1969)
- 3825 HANSON S T  
DEPENDENCE OF THE PHASE SHIFT ON ENERGY AND ATOMIC NUMBER FOR  
ELECTRON SCATTERING BY ATOMIC FIELDS  
PHYS REV, VOL 182, 97-103, (1969)
- 3826 ROBINSON E J  
ELECTRON SCATTERING BY THE METASTABLE RARE GASES  
PHYS REV, VOL 182, 196-200, (1969)
- 3827 FERRANTE C, GERACIYANO R  
DOUBLE-ELECTRON CAPTURE BY POSITRONS PASSING THROUGH HELIUM  
PHYS REV, VOL 182, 215-222, (1969)
- 3828 CHANG E S, TENKIN A  
ROTATIONAL EXCITATION OF DIATOMIC MOLECULES BY ELECTRON IMPACT  
PHYS REV LETTERS, VOL 23, 399-403, (1969)
- 3830 BRONGERSMA H M  
THE INTERACTION OF MOLECULES WITH LOW-ENERGY (0 - 30 EV)  
ELECTRONS  
THESIS, UNIVERSITY OF LEIDEN, 1968, 98 PAGES
- 3831 VROON D A, DE MEER F J  
PRODUCTION OF EXCITED ATOMS BY IMPACT OF FAST ELECTRONS ON  
MOLECULAR HYDROGEN AND DEUTERIUM  
J CHEM PHYS, VOL 50, 500-506, (1969)
- 3832 VROON D A, DE MEER F J  
PRODUCTION OF EXCITED HYDROGEN ATOMS BY IMPACT OF FAST ELECTRONS  
ON SOME SIMPLE HYDROCARBONS  
J CHEM PHYS, VOL 50, 573-579, (1969)
- 3833 SROGA M  
LICHTMISSION IN VAKUUMULTRAVIOLETT DURCH  
ELEKTROSTOSSANFANGUNG IN GASEN. TEIL B - UNTERSUCHUNGEN  
IN STICKSTOFF  
Z NATURFORSCH, VOL 24A, 390-403, (1969)
- 3834 REMPT R O  
ELECTRON-IMPACT EXCITATION OF CARBON MONOXIDE NEAR THRESHOLD  
IN THE 1.5- TO 3-EV INCIDENT ENERGY RANGE  
PHYS REV LETTERS, VOL 22, 1034-1036, (1969)
- 3835 HARRCHAND P, PASQUET C, HARRIS P  
THRESHOLD BEHAVIOR OF THE CROSS SECTION FOR IONIZATION OF  
HE AND AR BY NON-ENERGETIC ELECTRONS  
PHYS REV, VOL 180, 127-131, (1969)
- 3836 RESONAN J M, WILLIAMS J P, CUMLEY E H  
E-H RESONANCES IN THE 2P EXCITATION CHANNEL  
PHYS REV, VOL 180, 132-136, (1969)
- 3837 TRIPATHI A M, NATHAN H C, JOINT S H  
ELECTRON-IMPACT IONIZATION AND EXCITATION CROSS SECTIONS OF  
ATOMS WITH TWO OUTER-SHELL ELECTRONS  
J PHYS O ATOM MOL PHYS 2, VOL 2, 678-684, (1969)
- 3838 BURKE P G, TAYLOR A J  
THE SCATTERING OF ELECTRONS BY LITHIUM ATOMS  
J PHYS O ATOM MOL PHYS 2, VOL 2, 669-677, (1969)
- 3839 EVLF H L, REDWELL H O C  
ON A PEAKING APPROXIMATION IN SCATTERING THEORY  
J PHYS O ATOM MOL PHYS 2, VOL 2, 15-18, (1969)
- 3840 SAMMAN M, MUGLIN O  
ELASTIC SCATTERING OF POSITRONS BY HYDROGEN ATOMS  
AUSTRALIAN J PHYS, VOL 22, 133-134, (1969)
- 3841 WINTERTON M R, FIVE M L, BRACKMAN O V  
DISSOCIATIVE ATTACHMENT OF ELECTRONS TO NOY OXYGEN  
PHYS REV, VOL 183, 157-166, (1969)
- 3842 PEEK J M, GREEN T A  
IMPROVEMENT IN THE FIRST BORN THEORY OF ELECTRON SCATTERING  
BY MOLECULAR SYSTEMS. II. EXAMPLE OF THE 1 1 SIGMA GEARED -  
2 P SIGMA UNDERSTANDING TRANSITION IN H2O  
PHYS REV, VOL 183, 782-787, (1969)

- 3843 HENRY R J W, LANE M F  
POLARIZATION AND EXCHANGE EFFECTS IN LOW-ENERGY ELECTRON-H<sub>2</sub> SCATTERING  
PHYS REV, VOL 183, 221-231, (1969)
- 3844 SMOOREY V A  
PHASE SHIFTS FOR ELASTIC SCATTERING BY NEUTRAL ATOMS USING ISOELECTRONIC SEQUENCE EXTRAPOLATION TECHNIQUES  
J PHYS A ATOM MOL PHYS 2, VOL 2, 442-457, (1969)
- 3845 CHANEY F L, CHRISTOPHOPOU L G  
ELECTRON ATTACHMENT TO N<sub>2</sub>O  
J CHEM PHYS, VOL 51, 883-892, (1969)
- 3846 ANDERSON R J, HUGHES P W, NORTON T G  
EXCITATION OF THE 3 SINGLET, TRIPLET D AND 4 SINGLET, TRIPLET F LEVELS OF HELIUM BY DIRECT ELECTRON IMPACT, AND 4 SINGLET P TO 4 SINGLET, TRIPLET F COLLISIONAL TRANSFER  
PHYS REV, VOL 181, 198-205, (1969)
- 3847 KIM Y K, INOKUTI M  
GENERALIZED OSCILLATOR STRENGTHS OF THE HELIUM ATOM. II. TRANSITIONS FROM THE METASTABLE STATES  
PHYS REV, VOL 181, 205-214, (1969)
- 3848 BORST M L  
PRODUCTION OF METASTABLE MERCURY ATOMS BY ELECTRON IMPACT  
PHYS REV, VOL 181, 257-263, (1969)
- 3849 RUBIN K, REDERSON R, GOLDSTEIN M, COLLINS P E  
ELECTRON-ALKALI-METAL INELASTIC RECOIL EXPERIMENTS WITH SPIN ANALYSIS - EXPERIMENTAL METHOD AND THE SMALL-ANGLE BEHAVIOR OF THE 4 DOUBLET S 1/2 TO 4 DOUBLET P 1/2, 3/2 EXCITATION OF POTASSIUM  
PHYS REV, VOL 182, 201-214, (1969)
- 3850 GIBSON J R, GOLDER K T  
RESONANT DIFFERENTIAL SCATTERING OF ELECTRONS BY HELIUM  
J PHYS B ATOM MOL PHYS 2, VOL 2, 741-746, (1969)
- 3851 MCCONKEY J W, SIMPSON F P  
ELECTRON IMPACT EXCITATION OF THE 8 TRIPLET PI GERADE STATE OF N<sub>2</sub>  
J PHYS A ATOM MOL PHYS 2, VOL 2, 923-929, (1969)

**V. AUTHOR INDEX**

**PRECEDING PAGE BLANK**

## NOTES

|               |      |      |      |      |      |                    |      |      |      |      |      |
|---------------|------|------|------|------|------|--------------------|------|------|------|------|------|
| ADAMS J P H   | 3607 |      |      |      |      | CHAMBERS J P       | 3617 |      |      |      |      |
| ADAM R        | 2766 |      |      |      |      | CHAMBERLAIN M H    | 3618 | 3638 |      |      |      |
| ADAM R A      | 3686 |      |      |      |      | CHAMBERS H S       | 746  |      |      |      |      |
| ADRIEN W      | 1168 |      |      |      |      | CHANE P S          | 1999 | 2616 | 2791 | 2792 | 3655 |
| ADREN L       | 2000 |      |      |      |      |                    | 2096 | 3618 | 3700 | 3736 | 3762 |
|               |      |      |      |      |      |                    | 3638 |      |      |      |      |
| ALEXANDER I S | 1908 | 2726 | 3663 | 3699 |      | DUNN S J           | 1216 | 3646 | 3762 |      |      |
| ANDERSON W J  | 877  | 1942 | 2626 | 3646 |      | CHERON P S         | 3646 | 3671 | 3663 |      |      |
| ANDRICK A     | 3770 |      |      |      |      | CHILL P            | 1889 |      |      |      |      |
| ANDRICK S     | 3391 |      |      |      |      | CALLAWAY J         | 2999 | 3616 | 3772 |      |      |
| ARILL R H S   | 3629 |      |      |      |      | CARLETON M P       | 3638 |      |      |      |      |
| ARISTEAD R L  | 3298 |      |      |      |      | CARLSON K S        | 2988 |      |      |      |      |
| ASUNDI R K    | 2763 |      |      |      |      | CARTERSONT S S     | 2773 | 3646 | 3646 | 3728 |      |
| AUDREY S S    | 2178 |      |      |      |      | CATLEN S H         | 2636 |      |      |      |      |
| AMAM A H      | 3763 |      |      |      |      | CHAMBERLAIN S E    | 2912 |      |      |      |      |
| BAOON F H     | 2938 |      |      |      |      | CHANEY E L         | 3645 |      |      |      |      |
| BAILEY V A    | 2088 |      |      |      |      | CHANG E S          | 2885 | 3628 |      |      |      |
| BALDWIN C C   | 2648 |      |      |      |      | CHANEY P J         | 3678 | 3292 |      |      |      |
| BALLING L C   | 1944 | 3771 |      |      |      | CHEN J C Y         | 3378 |      |      |      |      |
| BALL J S      | 3378 |      |      |      |      | CHEN S             | 2328 |      |      |      |      |
| BAMERLEY S H  | 1182 | 2126 | 2127 | 2129 | 2758 | CHIASI J           | 2968 | 3623 |      |      |      |
|               | 2751 | 2968 | 3452 |      |      | CHOI C K           | 3695 |      |      |      |      |
| BANDSLEY J H  | 2884 |      |      |      |      | CHOUCHURY A L      | 1364 |      |      |      |      |
| BASSEL R H    | 3774 |      |      |      |      | CHRISTOPHERSON L C | 3886 | 3687 | 3645 |      |      |
| BASH R        | 1178 |      |      |      |      | CLAMPITT R         | 3796 |      |      |      |      |
| BATES S W     | 1183 |      |      |      |      | CLARKE E H         | 2784 | 2994 | 2985 |      |      |
| BEAUCHAMP J L | 3624 |      |      |      |      | COLLINS R E        | 2947 | 3649 |      |      |      |
| BEDERSON S    | 2178 | 2867 | 3649 |      |      | COMPTON S H J      | 2388 |      |      |      |      |
| BEIGMAN I L   | 2723 | 2946 | 3668 |      |      | COMPTON R H        | 3887 | 3763 |      |      |      |
| BELL K L      | 3818 | 3819 | 3288 | 3987 | 3723 | CONNELLY H J       | 3784 |      |      |      |      |
| BELV P        | 2115 | 3613 |      |      |      | COOPER J H         | 3896 |      |      |      |      |
| BELV S        | 1138 | 1982 | 2115 | 2118 | 3883 | CORRIEAM S J S     | 3799 |      |      |      |      |
|               | 3813 | 3736 |      |      |      | CORVIN K K         | 3799 |      |      |      |      |
| BENNETT H R   | 813  |      |      |      |      | COX S H            | 3827 |      |      |      |      |
| BERRY R S     | 3611 |      |      |      |      | CRAIGS J S         | 3851 |      |      |      |      |
| BERGSON A J H | 2349 |      |      |      |      | CRAWFORD C K       | 2825 | 2917 | 2918 | 3643 |      |
| BODANOV I P   | 1988 | 2628 |      |      |      | CRAWFORD R H       | 2433 |      |      |      |      |
| BOIKOVA W F   | 3684 |      |      |      |      | CROTHERS S         | 1171 | 2736 |      |      |      |
| BOLVIN A S    | 3899 | 3579 |      |      |      | CURLEY E K         | 3836 |      |      |      |      |
| BONESS H J H  | 3389 |      |      |      |      | CYZAK S J          | 2335 | 3244 |      |      |      |
| BONSEN T F H  | 3584 |      |      |      |      | DAIDER J H         | 1945 |      |      |      |      |
| BORST W L     | 3848 |      |      |      |      | DALY H R           | 1881 | 2422 |      |      |      |
| BOTTER R      | 3588 | 3581 | 3582 |      |      | DANDURS R          | 2837 |      |      |      |      |
| BOYD A H      | 1183 |      |      |      |      | DANCE S F          | 2788 | 2798 |      |      |      |
| BRACKMANN R Y | 3861 |      |      |      |      | DANNER S           | 3778 |      |      |      |      |
| BRANSCOMB L H | 2984 |      |      |      |      | DAVIDOVITS P       | 3543 |      |      |      |      |
| BRANSEN R H   | 2812 |      |      |      |      | DAVISON H S        | 3825 |      |      |      |      |
| BRATSEV V F   | 2796 |      |      |      |      | DE MEER F J        | 2349 | 2945 | 3941 | 3687 | 3729 |
| BRENN S       | 2638 |      |      |      |      |                    | 3812 | 3831 | 3832 |      |      |
| BREIG E L     | 2816 | 2824 |      |      |      | DEVATOV A H        | 3322 |      |      |      |      |
| BRINKMANN R Y | 3545 |      |      |      |      | DIEBLER V H        | 2215 |      |      |      |      |
| BRION C E     | 3888 |      |      |      |      | D                  |      |      |      |      |      |
| BROBY H S     | 3643 |      |      |      |      | DICKSON M H        | 3887 |      |      |      |      |

**PRECEDING PAGE BLANK**





|                   |      |      |      |      |      |
|-------------------|------|------|------|------|------|
| MILLER K J        | 2913 | 3206 | 3823 |      |      |
| MIRZA I M         | 2964 | 3524 | 3769 |      |      |
| MITTLEMAN M H     | 1941 | 2774 |      |      |      |
| MIYAMOTO S        | 3069 |      |      |      |      |
| MJOLSNESS R C     | 2211 |      |      |      |      |
| MOHLER F L        | 2215 |      |      |      |      |
| MOHR C H O        | 3738 |      |      |      |      |
| MOISEWITSCH B L   | 2059 | 2159 | 3216 |      |      |
| MONNIN C F        | 2786 | 3803 |      |      |      |
| MONTERDE-GARCIA A | 2753 |      |      |      |      |
| MOORE E J         | 3215 |      |      |      |      |
| MOORES D L        | 3518 |      |      |      |      |
| MORGAN L A        | 3704 |      |      |      |      |
| MORRISON D J T    | 2022 | 2685 |      |      |      |
| MOUSTAFA MOUSSA H | 2929 | 2945 | 3541 | 3729 |      |
| MULLER F          | 2969 |      |      |      |      |
| MUSCHLITZ E E     | 2175 |      |      |      |      |
| NESTOR C W        | 1364 |      |      |      |      |
| NEUERT H          | 2730 |      |      |      |      |
| NEWTON A S        | 3756 |      |      |      |      |
| NIEHAUS A         | 2737 |      |      |      |      |
| NIGHAN W L        | 3202 |      |      |      |      |
| NISHIMURA H       | 1968 | 3024 |      |      |      |
| NORTON T G        | 3846 |      |      |      |      |
| NOVICK R          | 2759 |      |      |      |      |
| NUSSBAUMER H      | 3732 |      |      |      |      |
| MUTTALL J         | 3801 |      |      |      |      |
| NYGAARD K J       | 3455 |      |      |      |      |
| NY T              | 2328 |      |      |      |      |
| OBEDKOV V D       | 3684 |      |      |      |      |
| OCHKUR V I        | 2756 | 3805 |      |      |      |
| Oksyuk YU D       | 2966 |      |      |      |      |
| OHIDVAR K         | 2867 | 2877 | 3061 | 3062 | 3526 |
|                   | 3746 |      |      |      |      |
| OOSTERHOFF L J    | 3810 |      |      |      |      |
| ORMONDE S         | 1976 | 1999 | 2427 | 2791 | 3055 |
|                   | 3056 | 3742 |      |      |      |
| OTSUKA M          | 1968 |      |      |      |      |
| PALINCHAK Y V     | 2907 |      |      |      |      |
| PANCHENKO V E     | 3693 |      |      |      |      |
| PAQUET C          | 3835 |      |      |      |      |
| PAVLOV S I        | 2729 |      |      |      |      |
| PEACH G           | 3585 |      |      |      |      |
| PEART B           | 2977 | 3296 | 3408 |      |      |
| PECUL K           | 2965 |      |      |      |      |
| PEEK J M          | 2210 | 3842 |      |      |      |
| PEIXOTO F M A     | 3744 |      |      |      |      |
| PENKIN N P        | 2967 |      |      |      |      |
| PERCIVAL I C      | 1168 |      |      |      |      |
| PERESSE J         | 1888 | 2878 | 3527 | 3569 | 3572 |
| PERLMAN H S       | 2695 |      |      |      |      |
| PETERKOP R K      | 3683 |      |      |      |      |
| PETRINI D         | 1138 | 2832 |      |      |      |
| PHELPS A V        | 2078 |      |      |      |      |
| PICHANICK F M J   | 2962 |      |      |      |      |
| PLATZMAN R L      | 2837 |      |      |      |      |
| PLUTA K M         | 1946 |      |      |      |      |
| POLUSHKIN I M     | 2986 | 2956 |      |      |      |
| POVCH M M         | 2725 |      |      |      |      |
| POWELL R E        | 1881 | 2422 |      |      |      |
| PRASAD S S        | 1183 |      |      |      |      |
| PRESNYAKOV L      | 2065 | 3698 |      |      |      |
| PROK G M          | 2786 | 3803 |      |      |      |
| PRZHONSKII A M    | 2715 |      |      |      |      |
| PURCELL E M       | 2063 |      |      |      |      |
| PU R T            | 2005 | 2959 |      |      |      |
| RABIK L L         | 1978 | 3058 |      |      |      |
| RAFIQULLAH A K    | 1364 |      |      |      |      |
| RAHMAN M          | 3840 |      |      |      |      |
| RAI D K           | 3804 |      |      |      |      |
| RAKHOVSKII V I    | 2729 |      |      |      |      |
| RAMSAUER C        | 2326 | 2327 |      |      |      |
| REDHEAD P A       | 3323 |      |      |      |      |
| REDKO T P         | 2967 |      |      |      |      |
| REES J A          | 2120 | 3051 |      |      |      |
| REINHARDT J       | 3343 |      |      |      |      |
| REINHARDT P W     | 3763 |      |      |      |      |
| REMPT R D         | 3834 |      |      |      |      |
| RICE J K          | 3545 | 3813 |      |      |      |
| RICHARDS H L      | 2175 |      |      |      |      |
| RIDGE D P         | 3824 |      |      |      |      |
| ROBINSON E J      | 2060 | 3826 |      |      |      |
| ROBISCOE R T      | 3001 |      |      |      |      |
| ROGALSKI M        | 2116 |      |      |      |      |
| ROSS K J          | 3514 | 3519 | 3776 | 3777 | 3778 |
|                   | 3809 |      |      |      |      |
| ROTENBERG M       | 3057 | 3388 |      |      |      |
| ROY A C           | 3705 |      |      |      |      |
| ROZSNYAI B F      | 2914 |      |      |      |      |
| RUBIN K           | 2822 | 2947 | 3849 |      |      |
| RUDDGE M R H      | 2022 | 2685 |      |      |      |
| RUDDOLPH P S      | 2899 |      |      |      |      |
| RUNDEL R D        | 2788 | 2798 |      |      |      |
| RUPPFL H M        | 2211 |      |      |      |      |
| RUTHERFORD J A    | 2308 |      |      |      |      |
| SAMPSON D H       | 2826 |      |      |      |      |
| SARAPH H E        | 2020 | 3294 | 3732 | 3739 |      |
| SCHACKERT K       | 3913 |      |      |      |      |
| SCHAEARER L D     | 3565 |      |      |      |      |
| SCHLESSINGER L    | 3511 |      |      |      |      |
| SCHRAM B L        | 2349 |      |      |      |      |
| SCHULZ G J        | 2878 | 2763 | 3389 |      |      |
| SCHULZ M          | 3747 |      |      |      |      |
| SCHUTTEN J        | 3729 |      |      |      |      |
| SCHWARTZ R        | 1889 |      |      |      |      |
| SCHWARTZ S B      | 3736 |      |      |      |      |

|                |      |      |      |      |      |
|----------------|------|------|------|------|------|
| SCOLSKY R M    | 3686 |      |      |      |      |
| SEATON M J     | 2020 | 3567 | 3732 | 3739 |      |
| SHARP T E      | 2205 | 2577 | 2939 | 3267 |      |
| SHARPTON F A   | 2128 |      |      |      |      |
| SHEMMING J     | 2020 | 3294 |      |      |      |
| SHEOREY V B    | 3567 | 3844 |      |      |      |
| SHEPPARD R J   | 893  |      |      |      |      |
| SHEVERA V S    | 3419 |      |      |      |      |
| SHIMIZU M      | 2057 |      |      |      |      |
| SHIMON L L     | 1969 | 2069 | 2366 |      |      |
| SHPENIK O B    | 2074 | 2757 | 3063 | 3410 |      |
| SIL N C        | 1178 | 1182 | 1904 | 2114 | 2126 |
|                | 2127 | 2129 | 2751 | 2968 | 3394 |
|                | 3452 |      |      |      |      |
| SIMPSON F R    | 3762 | 3851 |      |      |      |
| SIMPSON J A    | 1140 | 2841 | 2912 | 2962 |      |
| SINFILAN A L   | 3700 |      |      |      |      |
| SJOGREN H      | 2119 |      |      |      |      |
| SKARSGARD H M  | 3702 |      |      |      |      |
| SKERBELE A     | 2659 | 2694 | 2696 | 3546 | 3547 |
|                | 3809 | 3814 |      |      |      |
| SKLAREM R C    | 3516 |      |      |      |      |
| SKUBENICH V V  | 1989 | 3064 | 3374 | 3387 | 3578 |
| SLOAN I H      | 3215 |      |      |      |      |
| SMITH A C H    | 2790 |      |      |      |      |
| SMITH K        | 1976 | 2616 | 3784 |      |      |
| SMITH S J      | 3027 |      |      |      |      |
| SNODGRASS H B  | 2177 |      |      |      |      |
| SORELMAN I     | 2065 |      |      |      |      |
| SOLTYSIK E A   | 2072 |      |      |      |      |
| SRINIVASAN V   | 2120 | 3051 |      |      |      |
| SRIVASTAVA B N | 2964 | 3524 | 3769 |      |      |
| SROKA W        | 2782 | 3833 |      |      |      |
| STAFFORD F E   | 2944 |      |      |      |      |
| STANTON P N    | 3710 |      |      |      |      |
| STAUFFER A D   | 2013 |      |      |      |      |
| STOCKDALE J A  | 3806 | 3763 |      |      |      |
| STRAND T G     | 3248 |      |      |      |      |
| ST JOHN R M    | 2128 | 2838 | 2903 | 2923 | 3710 |
| SULLIVAN E C   | 3062 |      |      |      |      |
| SULTANOV A SH  | 3416 | 3417 |      |      |      |
| SUMMERS C      | 2888 |      |      |      |      |
| SUNSHINE G     | 2170 | 2178 |      |      |      |
| TAI H          | 3774 |      |      |      |      |
| TAKAHASHI T    | 3574 |      |      |      |      |
| TAKAYANAGI K   | 2783 | 2798 | 3574 | 3706 | 3707 |
| TAYLOR A J     | 2792 | 3055 | 3056 | 3734 | 3838 |
| TAYLOR H S     | 2777 | 3377 |      |      |      |
| TEKAAT T       | 3747 |      |      |      |      |
| TENKIN A       | 2027 | 3828 |      |      |      |
| TEUBNER P J    | 3774 |      |      |      |      |
| THOMAS B K     | 3750 |      |      |      |      |
| THOMPSON D G   | 1139 |      |      |      |      |
| TICE R         | 3283 | 3204 |      |      |      |

|                  |      |      |      |      |      |
|------------------|------|------|------|------|------|
| TISONE G C       | 2904 |      |      |      |      |
| TIWARI P         | 3804 |      |      |      |      |
| TRAJMAR S        | 3545 | 3813 |      |      |      |
| TRIPATHI A N     | 3709 | 3735 | 3837 |      |      |
| TRIPATHI D N     | 3804 |      |      |      |      |
| TRUHLAR D G      | 3728 |      |      |      |      |
| TUFFIN F         | 2870 | 3527 |      |      |      |
| TULLY J C        | 3411 |      |      |      |      |
| TURNER B R       | 2308 |      |      |      |      |
| UY O M           | 2900 |      |      |      |      |
| VAINSHTEIN L A   | 2065 | 2648 | 2733 | 2799 | 2946 |
|                  | 3060 | 3865 | 3698 |      |      |
| VALENTINE W A    | 1168 |      |      |      |      |
| VAN BLERKOM J    | 3214 |      |      |      |      |
| VAN BRUNT R J    | 2614 |      |      |      |      |
| VAN DEN BOS J    | 3730 |      |      |      |      |
| VAN DER WIEL H J | 2349 | 3819 |      |      |      |
| VAN ZYL B        | 2171 | 2772 |      |      |      |
| VASAVADA K V     | 2827 |      |      |      |      |
| VELDRE V         | 1970 |      |      |      |      |
| VINOGRADOV A V   | 2640 | 2799 | 3068 | 3065 |      |
| VOLKOV YU M      | 3568 |      |      |      |      |
| VON PUTTKAMER E  | 2658 |      |      |      |      |
| VOUGHT R H       | 2706 |      |      |      |      |
| VRIENS L         | 1159 | 2017 | 2841 | 3289 | 3584 |
|                  | 3819 |      |      |      |      |
| VROOM D A        | 3687 | 3812 | 3831 | 3832 |      |
| VUKSTICH V S     | 3528 |      |      |      |      |
| WALDRON H F      | 1945 |      |      |      |      |
| WALKER D W       | 3731 |      |      |      |      |
| WALLACE J        | 2075 |      |      |      |      |
| WANG K I         | 2918 |      |      |      |      |
| WANG K L         | 3643 |      |      |      |      |
| WAREING J B      | 2721 |      |      |      |      |
| WEAVER L D       | 2690 |      |      |      |      |
| WEINBERG M       | 3411 |      |      |      |      |
| WEISS H F        | 3802 |      |      |      |      |
| WEN C P          | 2123 |      |      |      |      |
| WEXLER B         | 613  |      |      |      |      |
| WHITAKER W       | 1999 | 2427 | 2791 | 3055 | 3742 |
| WHITTEKER J H    | 3748 |      |      |      |      |
| WILKINSON D      | 2075 |      |      |      |      |
| WILKINS R L      | 2777 |      |      |      |      |
| WILLIAMS A J     | 2915 |      |      |      |      |
| WILLIAMS J F     | 3373 | 3836 |      |      |      |
| WILLMANN K       | 2179 | 2658 | 3747 |      |      |
| WONG D Y         | 3370 |      |      |      |      |
| WOOLSEY J M      | 1214 | 3246 | 3760 |      |      |
| YAI' MONTOVA V E | 2620 |      |      |      |      |
| YATES A C        | 3248 | 3773 |      |      |      |
| YAVORSKY B       | 3616 |      |      |      |      |
| YEATES C M       | 2823 |      |      |      |      |

|                |      |      |      |      |      |
|----------------|------|------|------|------|------|
| ZAPESCHNYI I P | 1969 | 1989 | 1990 | 2069 | 2074 |
|                | 2725 | 2726 | 2757 | 2830 | 2833 |
|                | 2907 | 2909 | 3000 | 3063 | 3064 |
|                | 3416 | 3419 | 3528 | 3590 | 3699 |
| ZARE R N       | 2691 |      |      |      |      |
| ZHUKOV I G     | 3928 |      |      |      |      |
| ZIESEL J P     | 2760 | 2761 | 2762 | 2989 |      |
| ZINOVY O A     | 3560 |      |      |      |      |